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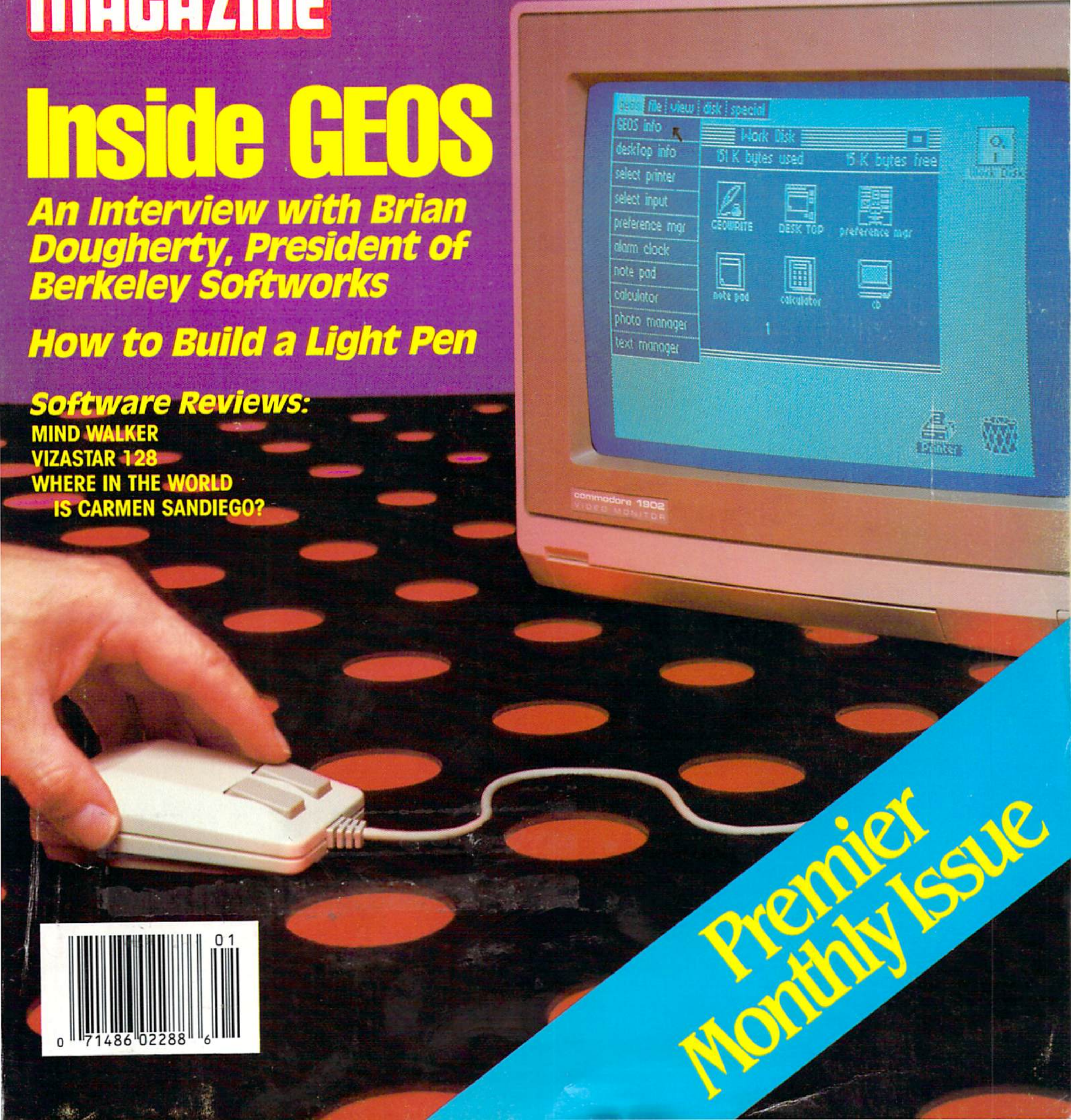
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An Interview with Brian Dougherty, President of Berkeley Softworks

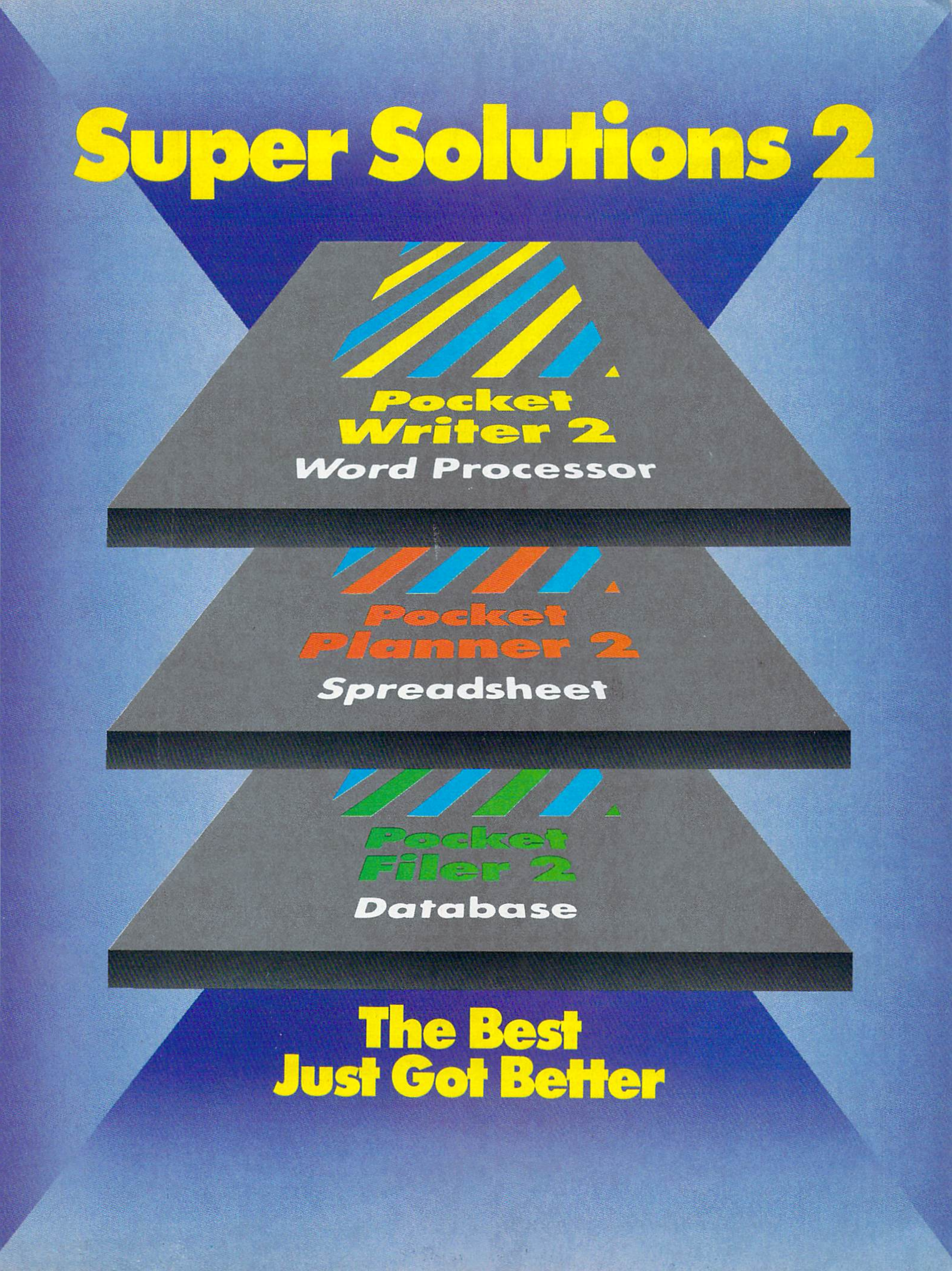
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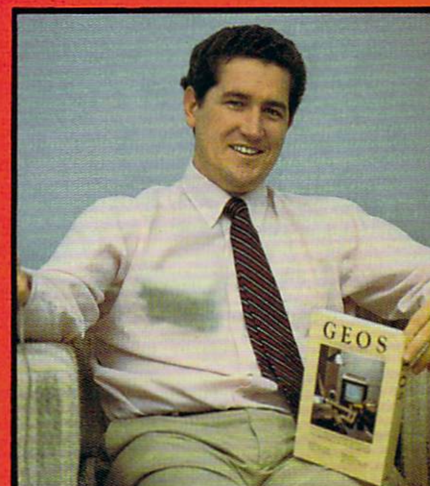
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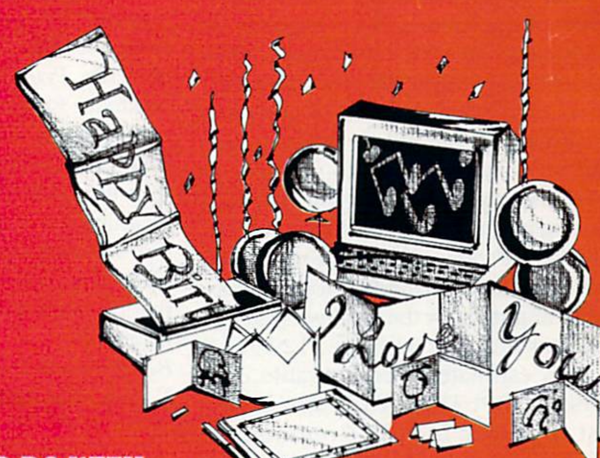
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DEPARTMENTS

FEATURES





Invisible BASIC Commands

To the Editor:

I read the article on Invisible BASIC by Donald Graham in the July/August, 1986, issue of *Commodore Microcomputers*. While poking numbers into the lines of BASIC, I found that if you poked 20 into the first five spaces of a line it would make the line number disappear and its contents would appear to "float." This is how I did it.

1) First, come up with a line number and five space holders (I used the letter A). I chose 10 as the line number to disappear.

10 AAAAA[space 10] [whatever you want to "float"]

2) Poke 2053 through 2057 with the value of 20 (if it is the first line of a C64 program).

3) List the program. It should now not have a line number.

Matt Pavlik
Champaign, Illinois

Video Digitizer

To the Editor:

When a manufacturer finds an article written about the kinds of products he produces, it normally catches his interest. So it was with curiosity that I read the review of the Kinney Video Digitizer by Bruce Jaeger in your July/August, 1986, issue of *Commodore Microcomputers*.

I was surprised to read that comparable products have either been unavailable or very expensive —"$200 or more," he says. Digital Vision, Inc., has been manufacturing its COMPUTEREYES line of video digitizers for the past three years and specifically for Commodore computers for the past two years. At about half the cost (Ed. Note: $129.95) of Jaeger's estimate of comparable digitizers, COMPUTEREYES is also a low-cost digitizer for the Commodore 64/128.

John R. Pratt, VP Marketing
Digital Vision, Inc.
Needham, Massachusetts

To the Editor:

Bruce Jaeger's review of the Kinney Video Digitizer (July/August, 1986) made me do a double-take, being a subject dear to our own efforts to interface photographs to the Commodore 64. Our own approach is decidedly different—and even less expensive—in that no video camera is required. We point a photocell at a typewriter platen which is the scanning vehicle for a photo, and produce an 80-column wide low-resolution rendition of a photo that reduces it to a new art form.

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Ben Johnson President,
Kaltek Labs Adjuntas, Puerto Rico

Reference Markers

To the Editor:

Finding the memory maps, ASCII and CHR$ tables in the *Programmer's Reference Guide* can be quite a task at times. However, the write/protect tabs that come in each box of disks make dandy markers. Just fold them in half on the desired pages, letting them stick out a bit, and suddenly things are much easier to find.

Jack Ryan
Eldorado, Arkansas

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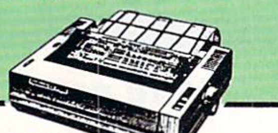
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NEWS



A Look at Epyx's New Joystick: the 500XJ

Do you ever sit in front of your computer playing arcade games until your eyes water and your hands ache? Do you keep telling yourself, "I'll quit as soon as I top my last high score"? Sure you will.

Well, I have some good news—and some bad news.

First the good news: Now your hands don't have to ache anymore. All you have to do is get your fingers around Epyx's new 500XJ joystick. The 500XJ is one of the first truly ergonomical joysticks. "Ergo...what?" you may ask. Ergonomics—the art of design based on anatomical, physiological and psychological factors rather than just technical, manufacturing or cost specification.

The measurements of the human hand, the natural angle of the wrist, the length and curve of the fingers were all taken into account. The base of the joystick fits comfortably in your hand, even when you hold it there for several hours. This is because there are no sharp corners to bruise your hand.

The fingers wrap around a gentle curve, and there is a slight groove for your thumb. The stick itself is a comfortable length with a bulge at the end to provide a positive grip.

The stick moves about five degrees from the home position to any point around the circle. Moving the stick requires a small force to overcome the spring return. The force is enough to prevent unintentional movement, but small enough to not be noticeable.

The stick has an audible but not tactile snap action. That is, when the stick closes any of the contacts, you hear a little click.

Epyx put the fire button where it should be: where the middle finger of your left hand can operate it. Not only is this more comfortable and less tiring, I think you will find that you can operate the button considerably faster with the finger than the thumb.

Hold the base of the joystick in your left hand and move the stick with your right hand. You should be absolutely delighted. However, due to its contouring, this joystick cannot be held in the right hand nearly as comfortably.

Now for the bad news: The 500XJ does nothing to relieve eyestrain induced by long hours of game playing.

Epyx's 500XJ is the best-selling joystick in Europe where it is marketed by Konix as the Speedking. It is available for the Commodore 64/128, VIC 20 and Amiga. It carries a five-year, ten million-shot warranty. Retail price was unavailable at press time. (Epyx, 1043 Kiel Court, Sunnyvale, CA 94089)

by D. Bruce Powell

NEWS

Laser-print Your GEOS Documents

Berkeley Softworks and QuantumLink have teamed up to offer laser printing of your **geoWrite** documents. Upload your files to QuantumLink and Berkeley Softworks will download it, laser-print it, then mail it back to you.

Here's how it works. In the **GEOS** SIG of QuantumLink is a program called Convert. Download this program and run it. This program changes **geoWrite** files into a format that can be uploaded to QuantumLink.

Choose the **geoWrite** document you wish to upload and convert it. Once you're connected to QuantumLink and the **GEOS** SIG, go to the GEOS Laser Printing section. Enter the correct shipping address, method of shipping, and number of documents you wish, then upload the file.

Within close to 24 hours, Berkeley Softworks will download your file, convert it back to a **geoWrite** document, print it out on a laser printer, and send it on its way back to you via first class mail or overnight delivery.

The cost is approximately $3 for the first laser-printed page and $1 for each laser-printed page after that. Berkeley Softworks will bill your credit card for the printing charges (and any overnight delivery charges). QuantumLink will bill you for the time spent on-line separately.

by Matthew Leeds

Buyer's Guide Update

Free Spirit Software has three products which were not included in the "128 Buyer's Guide," which ran in the October/November, 1986, **Commodore Power/Play.**

The Great War is a WWI strategy game that includes one- or two-player options with armies from 17 countries. Weather, terrain and lines of supply affect the outcome. It retails for $29.95.

BASICally Simple 128 is a tutorial on how to use the BASIC 7.0 commands, functions and operators in BASIC programs. It retails for $19.95.

Datafiler 128 is a database program which takes advantage of the 128's increased capabilities. It retails for $24.95. (Free Spirit Software, 538 S. Edgewood, LaGrange, IL 60525)

The Commodore Show—L.A.

Over 3,000 Commodore enthusiasts made their way to the Commodore Show—L.A. on September 20th and 21st, 1986, at the Airport Hilton in Los Angeles.

The two-day event, hosted by the West Coast Commodore Association, boasted speakers R.J. Mical (Commodore-Amiga), Brian Dougherty (Berkeley Softworks), William Volk (Aegis Development), and other well known figures in the Commodore community like Louis Wallace, Jim Butterfield, Louis Sander and Dick Immers.

Although familiar vendors and products were present, the number of new companies and new products amazed me. Everything from the Plus/4, C64 and C128 to the Amiga was supported. Here is a quick rundown of just some of the new companies and their products,



... With Spectacular Results!

Football puts you in control of every aspect of the game. You call the plays, offense and defense. Make substitutions from your 18-player bench. Then become an active participant in the play you've selected. You control the quarterback, then the running back or receiver once the ball is transferred. On defense, you become the in-action safety or linebacker for the play you've selected.

Discover how enjoyable a football simulation game can be. You will agree that **Football** is the first real football game on a computer. Available on disk for the Commodore 64/128 computers.

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or write or call for more information. For direct order please enclose $39.95 plus $2.00 for shipping and specify UPS or first class mail delivery. Visa, MasterCard, American Express, Diners Club cards accepted.

FOOTBALL

A True-to-Life Simulation ...

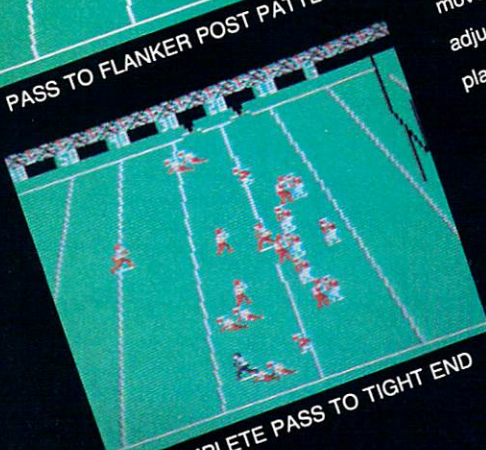
Forget everything you've seen or heard about sports simulation programs; **Football** sets new standards in realism and playability by simulating the real physics of the game.

Every offensive and defensive player has individual physical attributes (speed, power, and catching ability). Each quarterback's passing abilities are different. Players act and move individually on each play. And you can adjust the performance characteristics of any player, any way you like.

Football's overhead 3D perspective gives you a clear view of the entire field. The ball carrier is always highlighted for easy identification. And **Football's** real-time 30-second clock means fast-moving action from start to finish, with no game-slowing disk access.



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along with some new packages from established companies as well.

Among the new companies was **Digital Engineering,** who released Eye-Scan for the Commodore 64. This is an image-digitizing cartridge that plugs into the cartridge port of the 64. The $89.95 cartridge has a single RCA jack for the video input signal and has both sync and brightness controls.

The software is very professional, with pull-down menus and a continuously scrolling message line. Features include images of from one to eight gray levels and a complete programmer's utility package. Images can be saved in **Koala, Doodle!** or **Blazing Paddle** formats.

A second product from Digital Engineering is tentatively called Tardus-125. This is a $98.95 full-featured sound digitizer for the Commodore 64 that plugs into the user port. The cartridge allows both microphone and line-level inputs with a line-level output, and can handle sampling rates from 1KHz to over 31Khz.

Similar professional software drives the Tardus-125 and allows waveform plotting and special effects such as reverb, chorus, echo and pitch conversion. A unique feature is the ability to use it along with a cartridge port MIDI interface. Sample your voice and play it through your synthesizer!

Along the same lines are a whole line of products from a relatively new company called **Sonus.** Their product line includes **Super Sequencer 64** and **Super Sequencer 128** at $225.95 and $275.95 respectively. While not inexpensive, they include such professional features as 16 MIDI channel control with meter and tempo adjustments, step record and play, velocity leveling, programmable mute flags and cue points, and transposing of tracks, sequences or songs. A scaled down version for the 64 called **Glasstracks 64** is also available for $69.95.

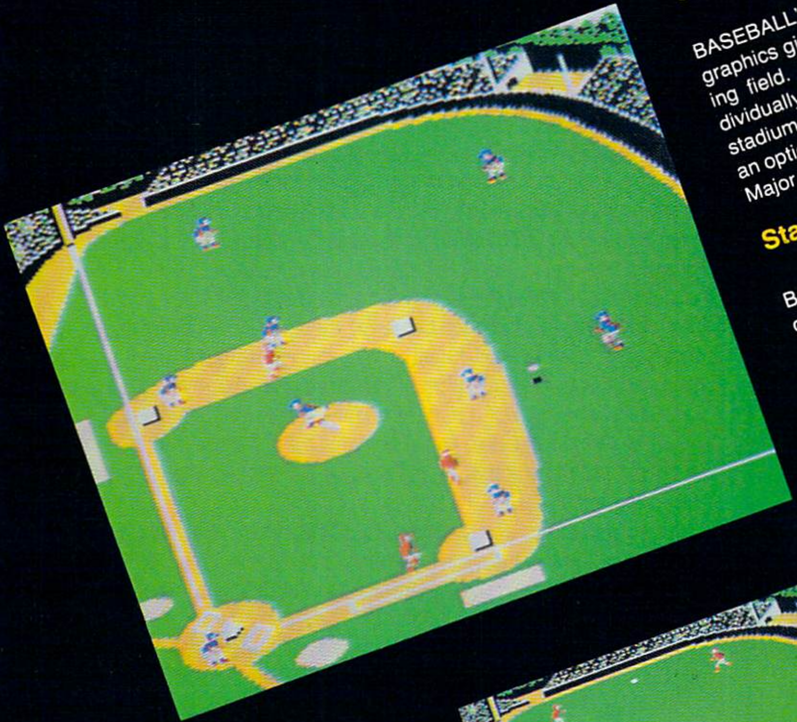
The Sonus line includes other products such as Commodore MIDI interfaces (with tape sync), MIDI event editors, sonic editors and a series of programs for both the Casio and Yamaha lines of synthesizers.

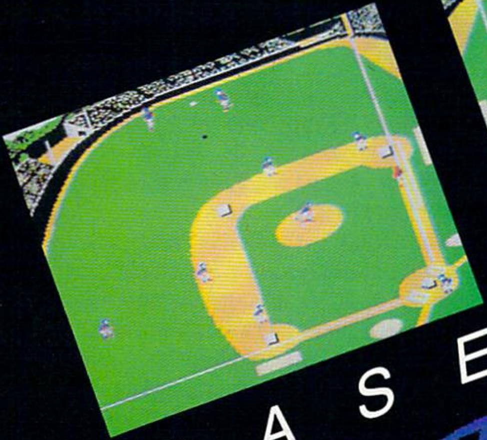
S.O.G.W.A.P. Software was at the show with their **Big Blue Reader.** This piece of software allows you to copy files back and forth between 1571 and MS-DOS formats. There's not too much to be said for this software other than, "It works!" I watched it happen. The word is that they're adding CP/M format to the list so you can swap between any of the three. A very nice program for $79.95.

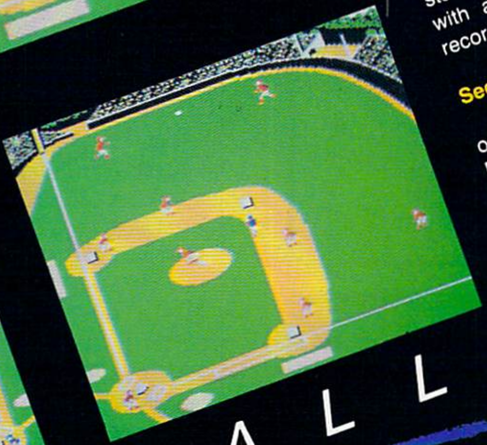
Unison World demonstrated their **Printmaster Plus** for the Amiga. They got a jump on everyone by releasing not only the program itself, but **Art Gallery I** and **Art Gallery II**, too. **Printmaster Plus** comes with 111 picture graphics, 11 patterns and borders, 10 fonts, save and load capabilities, a graphic editor and the ability to use two different graphics on the same page. The two **Art Gallery** disks each add another 140 picture graphics.

Midnite Press has announced a new book called **Getting the Most Out of GEOS.** Written by Jim Oldfield and Tim Sickbert, the book contains over 200 pages and is aimed at all levels of **GEOS** owners. The book contains hints for using **geoPaint** and **geoWrite** as well as some type-in programs that allow you to import graphics from other programs, import text from other word processors, and translate files between **GEOS** and standard sequential format. The book is $14.95 with a companion disk for $9.95.

A new company called **Sedona Software** showed their **Money Mentor** software package for the Amiga. At $99.95, it provides a home finance program with many features and easy-to-read displays. The program allows up to 200 budget categories, 30 accounts and automatic check printing. Over 50 different graphic







BASEBALL

From the author of FOOTBALL comes an incredibly sophisticated, realistic and complete statistical baseball simulation for one or two players. Game play, manager's functions, graphics, and a statistical library establish BASEBALL as the ultimate sports simulation program.

Game Play

BASEBALL's underlying statistical framework simulates the realities of baseball like never before. Within this framework, the program considers each player's batting statistics against both left-handed and right-handed pitchers, and pitchers statistics vs. left- and right-handed batters. Every player's fielding and base-running abilities are also considered (an important factor when attempting to steal a base, etc.).

Select the team you'd like to manage, then pick the team you want to play against. Every team from the 1985 season is accurately represented, along with eight classic teams from the past. Determine your starting lineup, designate a starting pitcher, and make player substitutions when necessary. You call the plays, offense and defense. In a one-player game, your computer opponent displays uncanny intelligence in reacting to your managing decisions.

Manager's Functions

Built-in manager's functions provide extra versatility. You can trade team players, draft new players, create your own team, even form your own league. The program's statistics tracker keeps track of your team's season statistics and individual player year-to-date stats.

Graphics

BASEBALL's highly-detailed animated graphics give you a perfect view of the playing field. Each player acts and moves individually on every play. Three different stadiums are included with the program, and an optional Stadium Disk lets you play in any Major League stadium in the United States.

Statistics

BASEBALL can maintain a complete statistical record of each team player's performance. All player stats and game Box Scores can be displayed on the screen or sent to an external printer for a hardcopy printout.

BASEBALL also includes a unique Auto-Play option that lets the computer play a complete game in less than three minutes. A whole series of games can be played unattended, and an entire season of player and team statistics can be compiled over several days with all game stats printed out for your records.

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or write or call for more information. BASEBALL is available on disk for the Commodore 64 and Commodore 128 computers. For direct orders please enclose $49.95 plus $2.00 for shipping and specify UPS or first class mail delivery. Visa, MasterCard, American Express, and Diners Club cards accepted.

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NEWS

and numerical reports are available to study your past, present or expected future spending.

The most interesting feature of the program is called "smart scrolling." This is a technique in which previous transaction data is automatically recalled when entering a new transaction. For example, entering a check for the electric company will automatically retrieve information for the previous amount paid, budget category, tax classification and any comments that were entered.

Xetec was also at the show with the Printer Enhancer, a 64K Centronics parallel printer buffer for the Amiga (or C64 with an interface). The Printer Enhancer includes eight internal fonts and supports two independent printers. Front panel controls allow the selection of the desired printer and font. The fonts include italic, shadow, block and news, and allow you to make masterful letters with virtually any software and dot matrix printer. The suggested retail price is $249.95.

Xetec also announced **Fontmaster 128**, which is scheduled for a November release. Enhanced features include more than 40 fonts, support for more than 100 printers, macros, 80-column screen, and help screens. It retails for $59.95.

A Canadian company called **Zirkonics** demonstrated a very powerful text editor for the Amiga called **PTE** (professional text engine). A macro programming language allows you to have user-programmable keys, mouse buttons, functions and pull-down menus. Other features include recall of up to 30 previous command lines, editing of as many files as will fit in memory, and dynamically allocated memory usage. A very nice package at $99.95.

A new magazine called **Money Machine** was on display. For $16 you get six issues and a special buyer's guide. The magazine focuses completely on the business side of using your Commodore 64, 128 and Amiga. Each issue includes in-depth business software reviews, a spreadsheet template, and a **Superbase** tutorial. The premiere issue contained 40 pages with no display ads. It looks promising.

Brown-Wagh is releasing a desktop publishing program called **Publisher** ($199.95) by mid-November and a data base called **Organize!** ($99.95) by mid-October. Both are for Amiga.

We would like to congratulate the West Coast Commodore Association on another great show, and we look forward to the San Francisco show on February 6th, 7th and 8th of 1987.

by Jim Gracely

Brown-Wagh
100 Verona Court
Los Gatos, CA 95030
408-395-3838

Digital Engineering
2718 SW Kelly, Suite 165
Portland, OR 97201
503-274-0652

Midnite Press
1212 Hagan
Champaign, IL 61820
800-222-4441

Money Machine
2142 E. Silver Springs Boulevard
Ocala, FL 32678
904-622-1022

Sedona Software
11844 Rancho Bernardo Road, Suite 20
San Diego, CA 92128
619-451-0151

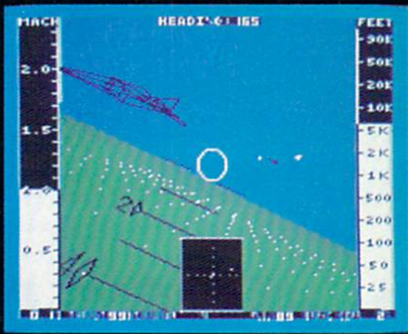
S.O.G.W.A.P. Software
611 Boccaccio Avenue
Venice, CA 90291
213-822-1138

Sonus
21430 Strathern, Suite H
Canoga Park, CA 91304
818-702-0992

Unison World
2150 Shattuck Avenue, Suite 902
Berkeley, CA 94704

Xetec
2804 Arnold Road
Salina, KS 67401
913-827-0685

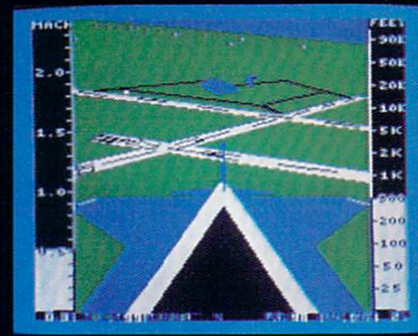
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F-16 Dogfight with Enemy MiG-23 Fighters



F-18 on the Deck of a Nimitz-Class Aircraft Carrier (Control Tower View)



F-16 High-G Pullout over Detailed Wargame Scenery (Rear View)

Jet

From the author of Flight Simulator II comes a new dimension in realism. Jet simulates two fast and maneuverable supersonic jet fighters, a land-based F-16 or a carrier-based F-18. The simulator includes modern electronic flight instrumentation and the most advanced weaponry available. Jet's simulation sophistication, combined with excellent visual attitude references, makes it truly enjoyable to fly.

Easy aircraft control coupled with ballistic thrust gives you the kind of aerobatic maneuverability only a modern jet fighter can provide. Jet's attitude indicator is easy to read no matter what your orientation. A full-screen out-the-window view helps you get the most out of Jet's excellent flight controls. And that's a major consideration when flying at speeds in excess of 1300 MPH.

With Jet you can fly through either structured or non-structured environments. Engage in a deadly variety of combat missions. Explore the wargame territory, or relax by practicing precision aerobatic maneuvers. Load in scenery from optional United States Scenery Disks. You can even load in scenery off the Flight Simulator II disk.

New high-performance graphic drivers provide beautifully detailed scenery in either day or night-flight modes. You can look forward, left, right, rearward, or straight up out of the cockpit with a single keypress. The Jet simulator even includes a special view-magnification feature that lets you zoom-in to identify objects or details at a distance.

Jet will run on any Commodore 64 or Commodore 128 computer with one disk drive and either color or monochrome monitor.

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or write or call for more information. For direct orders please enclose $39.95 plus $2.00 for shipping and specify UPS or first class mail delivery. Visa, MasterCard, American Express, and Diners Club cards accepted.

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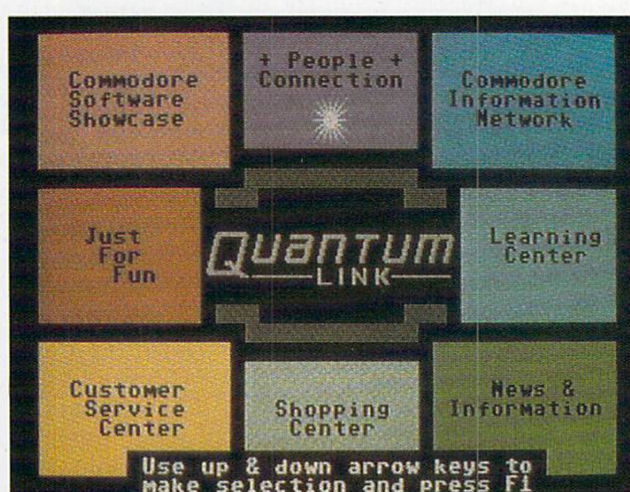
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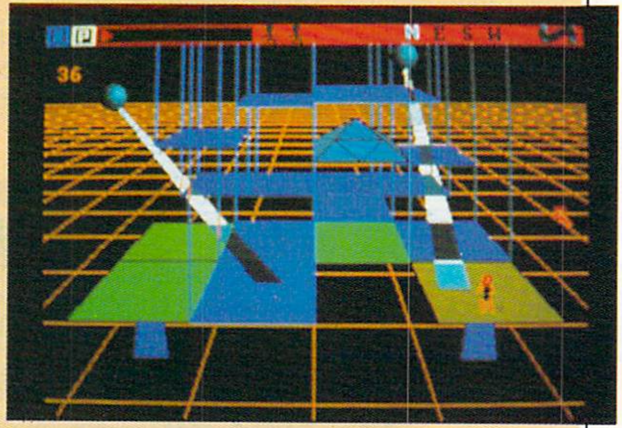
QuantumLink's full color, easy-to-use menu.

REVIEWED BY ERVIN BOBO

Mind Walker

Computer: Amiga
Publisher: Commodore Business Machines
1200 Wilson Drive
West Chester, PA 19380
Medium: Disk
Price: $49.95

You are a nice-guy scientist who has gone mad from overwork—and you are imprisoned in your mind.



Mind Walker takes advantage of all the unique features of the Amiga—and the result blurs the line between computer games and computer art. And it does it so well that you'll probably not play it for the sake of winning; you'll play it just to get a look at the next level.

Mind Walker is, literally, an adventure in the mind. Had it existed in 1968, there might not have been a use for psychedelic drugs. The scenario is simple: You are a nice-guy scientist who has gone mad from overwork. You are now lost in the world of your mind.

Worse than that, your ego has fragmented into four personalities: the Strong Man, who solves problems with muscle; the Whiz Kid, a mathematical prodigy; the Spriggan, an ugly and awkward science-fiction creature; and the Water Nymph, everything you always wanted a woman to be. The fact that you may also have an identity crisis is minor compared to the other problems you face.

In play, you'll find yourself looking at a landscape that might have been designed by Dali: on a dark field, perspective lines grow together toward the horizon and in the foreground is a multilevel, multicolored—for lack of a better word—"construction" composed of planes, cubes, water patches and towers.

Above one plane, a crystalline shape sparkles. This is a Square of Crystallized Thought. While eerie music plays in stereo, with sounds reminiscent of the Theramin used in old science fiction movies, one of your alter-egos materializes on that square. Move him or her with the joystick, and the square upon which he stands develops a black center.

Now, as you continue to move about the construction, other squares upon which you step develop the same black center. This is the object of the first stage of the game. What you are doing is developing a Path of Coherent Thought—which, as everyone knows, is the path back to sanity.

Because the construction is composed of blocks as well as planes, you may not be able to see where your alter-ego is going. No problem. At top right of the screen are letters representing the four directions. Click on one with the mouse and the entire construction rotates to show you what it looks like from that direction.

You'll want to try to keep a North orientation, however, for that is the way the map is oriented. Access the map by clicking on the Map icon and the screen changes to show you a multicolored square with your present location indicated by a hollow square. To see how much you've accomplished, click on Path and the path you've created so far is shown in yellow. To see how much you have yet to do, click on Show Entire Map.

To find the location of the pyramids, click on Pyramid. Why do you need to know about pyramids? Well, sooner or later your character will step on a square he can't change. To continue, you'll need to change your body type, and this is done by standing under a pyramid. (Yes, I know how this sounds, but we have called it quits with reality.)

Which alter-ego is necessary? Experiment. Each has different strengths and capabilities.

Building the Path of Coherent Thought, however, is not as simple as it sounds. There are other crystals, and if you step on them, you'll erase all you've done so far. You cannot make a path longer than 32 blocks, so keep that in mind when you start. There are Bad Thoughts floating around, trying to zap you with Nihilism Beams. As the game progresses, these become Horrible Thoughts.

You do have a weapon of defense, a Fractal Ray, and it will work to protect you from almost everything. Almost. You see, there is this Existential Death Mask and....never mind. You have three lives, indicated by icons at the top of the screen. Do the best you can with them.

All this is only the first stage. A completed Path of Coherent Thought will enable you to escape from the Mind and into the territory of the Brain. To get there, find a Tube (use the map) and fall down it (trust me). On the way down, grab a green door with the on-screen hands and enter it to negotiate a terrain that is a maze of flashing neurons. Now you must locate and retrieve the container holding the Shards of Sanity.

Of course, the Vicious Viruses will try to halt your progress by sapping your strength, but fortunately you have a Thought Reflector which will control the dotted line of your thoughts, thus becoming a weapon of defense.

In the third stage, the Deep Subconscious, you must piece together those Shards. This is done in what might properly be called an arcade-type game, where correctly placing a Shard of Sanity results not only in adding to your score but in the building of the most beautiful "ink-blot" you've ever seen. This you do to arrive back at Sanity.

It must be said here, however, that *Mind Walker* makes madness so attractive that you may not want to become sane. In that case, add your initials to the scoreboard (or just click on "Forget it")

Continued on pg. 128



Flight Simulator II Scenery Disks

The Challenge of Accomplished Flight

With a realism comparable to (and in some ways even surpassing) $100,000 aircraft flight simulators, Flight Simulator II includes full flight instrumentation and avionics, and provides a full-color out-the-window view. Instruments are arranged in the format standard to modern aircraft. All the radios needed for IFR flight are included. Front, rear, left, right, and diagonal views let you look in any direction. Program features are clearly documented in a 96-page Pilot's Operating Handbook.

For training in proper flight techniques, Flight Simulator II includes another 96-page instruction manual, compiled by two professional flight instructors with over 8,000 hours flight time and 12,000 hours of aviation teaching experience. You'll learn correct FAA-recommended flight procedures, from basic aircraft control through instrument approaches. To reward your accomplishments, the manual even includes a section on aerobatic maneuvers.

The Realism and Beauty of Flight

Go sight-seeing over detailed, realistic United States scenery. High-speed graphic drivers provide an animated out-the-window view in either day, dusk, or night flying modes.

Flight Simulator II features over 80 airports in four different scenery areas: New York, Chicago, Seattle, and Los Angeles. Six additional Scenery Disks covering the entire Western half of the United States are now available in IBM and C64/128 disk formats. Apple and Atari versions will be released soon. Each disk covers a geographical region of the country in detail, and is very reasonably priced.



The Pure Fun of "World War I Ace"

When you think you're ready, you can test your flying skills with the "World War I Ace" aerial battle game. This game sends you on a bombing run over heavily-defended enemy territory. Six enemy fighters will attempt to engage you in combat as soon as war is declared. Your aircraft can carry five bombs, and your machine guns are loaded with 100 rounds of ammunition.

See Your Dealer. Flight Simulator II is available on disk for the Apple II, Atari XL/XE, and Commodore 64/128 computers for $49.95. Scenery Disks for the C64 and IBM PC (Jet or Microsoft Flight Simulator) are $19.95 each. A complete Western U.S. Scenery six-disk set is also available for $99.95. For additional product or ordering information, call (800) 637-4983.

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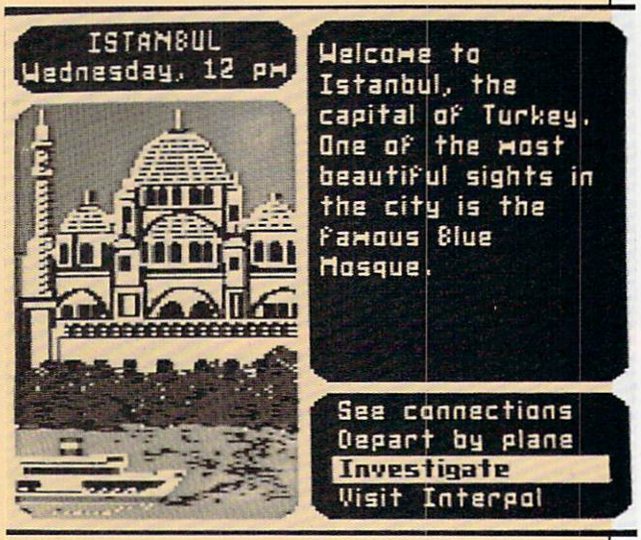
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REVIEWED BY MARK COTONE

Where in the World Is Carmen Sandiego?

Computer: Commodore 64
Publisher: Broderbund
17 Paul Drive
San Rafael, CA 94903
Medium: Disk
Price: $34.99

As a private eye, you must flush out every member of Sandiego's band and place them behind bars.



Answering Broderbund's title question will take a little more than a map and a magnifying glass. For Carmen Sandiego is not a place, but a person, and a very elusive person at that. With roots as a double, triple and quadruple agent, she is now leader of the Villains' International League of Evil (V.I.L.E.), a band of professional thieves who are about to stage a series of daring worldwide robberies.

As a private eye, your goal is to flush out every member of Sandiego's band and place them behind bars. It's an entertaining and educational fact-finding race through some of the world's most famous cities as you pit your wits against V.I.L.E.'s worst.

The game begins at your home base, the Acme Detective Agency. After you identify yourself to the office's on-screen Crime Computer, a news flash outlines the details of your impending top secret assignment. You can never be sure where the Sandiego gang will take you. With 10 possible suspects, 30 cities and close to 1,000 different clues, each game is guaranteed to be a challenge.

Being the methodical sort, you begin the investigation at the scene of the crime. Where in the world you go from here is dictated by the clues you discover through your detective work.

Your play field is divided in half. The right side of the screen is reserved for text, either highlighting some relevant points of interest or relaying the witnesses' answers to your probing inquiries. The left half of the screen is the visual side, giving a crisp graphic depiction of each city you visit.

These representations are colorful and accurate. New York offers its rejuvenated Statue of Liberty before the skyscraping Twin Towers, the Eiffel Tower stands tall against the cloud-wisped blue skies of Paris, and the pink blossoms of Japan frame a distant, majestic Mount Fuji. But don't be fooled. Behind these serene scenes is the winding trail of a thief.

The task of locating and arresting a suspect is three-staged. First, you must comb the streets for witnesses to unearth clues to the perpetrator's physical characteristics. This will usually require travel to several different cities. When enough information is gathered, the player then returns to headquarters and feeds all the data into his trusty Crime Computer. With any luck, a suspect will be identified, and an arrest warrant issued. With this in hand, the final step is to keep on the heels of the crook until he or she can be apprehended and the stolen treasure returned.

To help players in their investigation, Broderbund offers three information sources: the Official Interpol Map, which lists all the known V.I.L.E. operation bases; the classified Police Dossier, which

Continued on pg. 127

Travel Tips

From the V.I.L.E. Files

All of you rookie flatfoots should make the Sleuthful Hints section of the User's Manual your first research stop. The tips provided there, in addition to the ones I've listed below, should help to clear the vision of your private eye.

- Every so often, a V.I.L.E. henchman will walk across the screen, signaling that you are hot on the criminal trail. After the third henchman appears, you will then cross the path of the actual suspect. Make sure you are carrying the correct arrest warrant at this time. If you are caught unprepared, the villain will slip through your fingers and you will be removed from the case.
- Before you are certain of who has committed the crime, you should comb every possible city location for clues. But after you have singled out a prime suspect and an arrest warrant has been issued, you can save time by first checking the connections chart (that doesn't take any time off the clock), then visiting just enough locations to correctly narrow down the escape routes. Don't waste time with unnecessary leg-work.
- If you fly to a new city and the first witness you come across hasn't seen your suspect, then you are in the wrong city. Don't bother questioning anyone else, just get out.
- When you do fly to a wrong city, backtrack to your last city. It makes more sense to do a little more research on familiar ground than to fly aimlessly.

REVIEWED BY GARY V. FIELDS

Vizastar 128

Computer: Commodore 128
Publisher: Solid State Software
1125 E. Hillsdale
Boulevard
Forest City, CA 94404
Medium: Disk/Cartridge
Price: $119.97

The 128 version of Vizastar *has increased memory size, increased speed, an 80-column screen display, and easier back-up.*

Vizastar 128 is three integrated business programs rolled into one. Author Kelvin Lacy calls his creation an information processor, which pretty accurately describes it. It is a powerful spreadsheet, database and graph package, all able to work at once. After booting the disk, all you need to do select the program.

There's nothing quite as enjoyable as running into an old friend who has improved with age. The appearance of *Vizastar 128* evoked similar emotions. The original *Vizastar* for the Commodore 64 is one of the more professional business products on the market, and *Vizastar 128* is the full grown, big brother of that product.

When I added my first Commodore 128 to my office, one of my first queries was to the distributor of *Vizastar* to see if a 128, 80-column version was in the works. The answer was yes, but the final product took nearly a year to surface. Fortunately, *Vizastar 128* is as good as its namesake and worth the wait.

The command structure and features of *Vizastar 128* are almost carbon copies of the 64 version. In fact, *Vizastar 64*-created files can be read and used by *Vizastar 128*. Both facts are good news, since many former users of *Vizastar 64* will be moving up.

To begin, you must insert the security cartridge into the 128's user port. The program itself is auto-booting, so getting started is as simple as installing the disk and flipping on the computer. And because the security cartridge is visible only to *Vizastar 128,* there's no need to remove it when using another program. The program disk is not copy-protected and Solid State encourages users to make a security copy of the disk.

After the title screen fades, you will see a grid-covered screen with three status lines at the top. The status lines display the command menus, the cursor cell's content, current worksheet name, free memory, and mode of operation. The options on the menu line can be activated in two ways. You can either space over until the feature you need is highlighted and press RETURN, or access the feature directly via the keyboard.

To use the direct input method, simply press the Commodore key (which activates the command menu) and press the first letter of the command you need. For instance, to copy a section of the spreadsheet using the keyboard, simply press the Commodore key (activate menu), the S (activate SHEET commands), and C (activate COPY options).

Either selection scheme works, and although most beginners will prefer the highlight commands at first, many will most likely switch to the direct-command system as they learn the command structure. Because keyboard commands are always the first letter of the command's name, you'll learn the direct commands whether you intend to or not.

While each program can perform alone, their ability to interact doubles their appeal. And files created here can be used by *Vizastar 128*'s sister word processor, *Vizawrite 128 Classic,* as well as most other popular word processors. Best of all, the program is easy to to master. An on-screen tutorial explains most of the functions, and the program disk comes with both a tutorial and reference guide. You may change change the data used in the tutorial if you wish.

Because *Vizastar 128* reserves 60K of the 128's memory for worksheets, it can manage a spreadsheet 64 columns wide and 1,000 rows deep. It supports up to 9 windows, over 30 formula functions, word processor-like editing commands, and extensive printing options like automatic headers, footers, pagination and margins.

While I doubt I will ever need nine different windows for my personal spreadsheets, I did find three very useful. By locking on two windows, I could adjust both to display information in cells a distance apart. Then by opening a third, I could generate a bar graph to emphasize the relationship between the data. Finally, with all that displayed on the monitor's screen, I could dump it all to my printer by simply pressing two keys. The printout exactly duplicated the screen's display and supplied me with a useful copy of the data I could carry in my briefcase.

One very nice *Vizastar* feature is its ability to "protect" cells so their content cannot be accidentally altered. If you've ever edited or overwritten a formula by mistake, you'll appreciate this feature. If that weren't enough protection against those among us who do foolish things, *Vizastar* has another security scheme. If you enter and alter an unprotected cell by accident, you can instantly reconstruct the cell by pressing RUN/STOP instead of RETURN.

Another feature I liked was the constant status display as the cursor was moved from cell to cell. The contents of each cell is clearly identified as formula, value, text, general, integer, currency, date, or scientific as the cursor passes over each cell. And because the memory status is constantly displayed, you never have to worry about exceeding the limitations of the program.

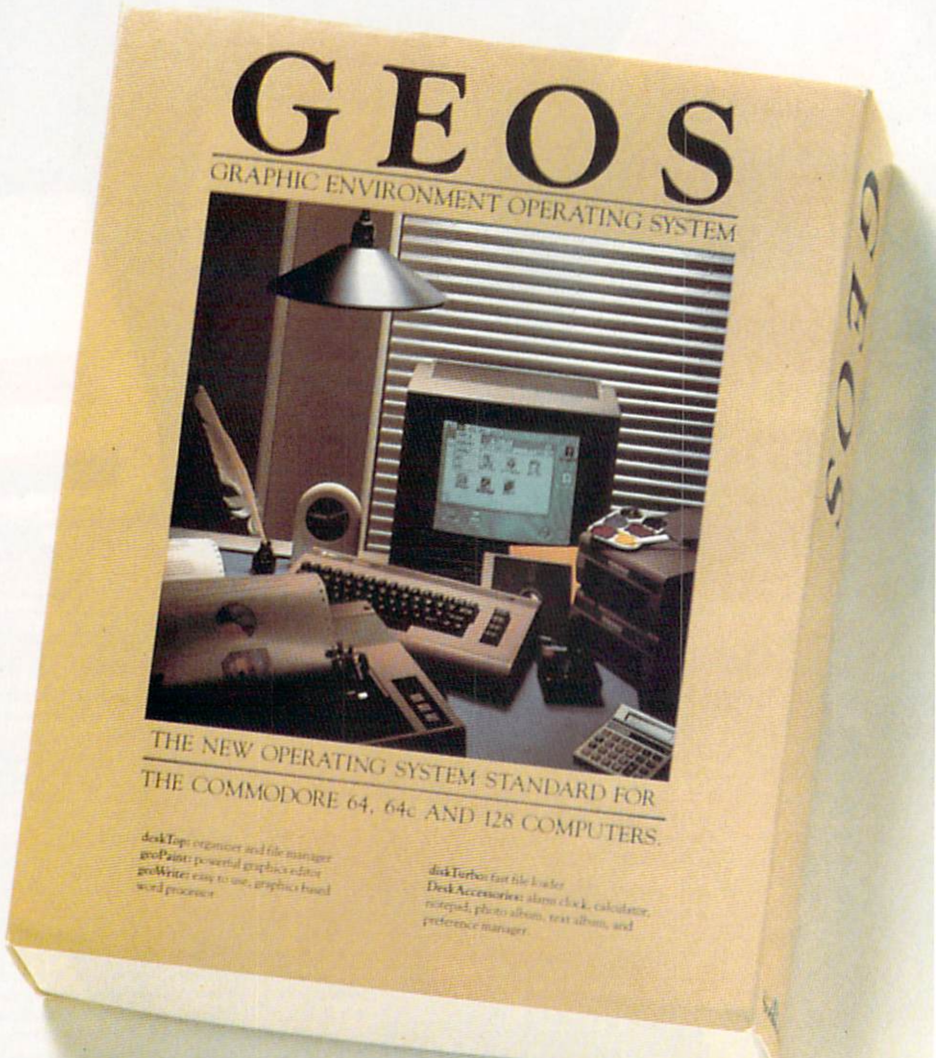
Vizastar's datamanager program is just as well designed. The program can squeeze 120 data bases on a single disk, and each can hold up to 15 separate files. Creating is merely answering a YES/NO query, and designing the record display is just as easy.

Each record stored by the data base can hold up to nine screens of information (over 7,000 characters) divided into 64 fields. Each field can hold up to 120 characters, and each record can have one key field. The size of a file is limited only by the disk space, but a typical data base using a 1541 drive should hold at least 1,000. Because you can include formulas in your design, you can do things like have the data base alert you to deadlines, product expiration dates, money certificate maturity dates, and so on.

If you've never used a business-designed data manager, these specifications may overwhelm you. They shouldn't. They illustrate just how powerful the program is and how flexible it can be for your business. Because the spreadsheet and data manager are integrated, you can

Continued on pg. 120

SCIENTISTS A
DISCOVER NE



When we started our company on the west coast, people thought we were a little spaced out. So you can imagine their reactions when we announced we'd discovered a new universe.

People laughed. People scoffed. And they really freaked out when we told them where we'd found it:

Inside a Commodore 64.

It's called GEOS. And it turns any Commodore into a powerful PC that holds its own against any computer, no matter what kind of fruit it was named after.

GEOS: The superior intelligence. Of course, we always knew Commodores possessed superior brains. It just took GEOS to discover them.

You see, GEOS opens your Commodore to a huge universe that can hold an infinite number of applications. Which means that GEOS can do just about anything the expensive PC's can do, including one thing they can't:

Add even more GEOS applications that are being developed even as you read this.

Increase your speed to warp factor 7. The first thing you notice with GEOS is how its diskTurbo speeds up your Commodore's disk loading and storing time.

Not twice or three times as fast. But five to seven times faster than normal. Which lets you streak through files and documents at what seems like warp speed.

And that saves you endless time.

Every universe comes complete with a desk. The way to keep order in our universe is with the GEOS Desktop. It's just like your desk at home, only without the coffee stains.

The Desktop keeps your art and documents filed, and comes

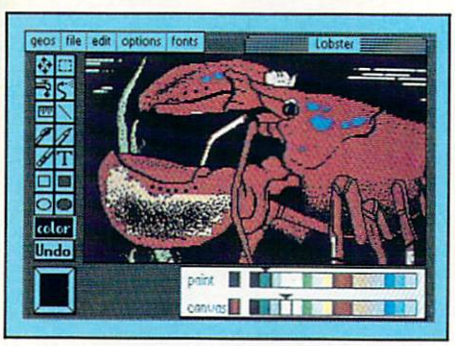
AT BERKELEY
EW UNIVERSE.

with all the accessories you need to keep you organized:

An alarm clock keeps you punctual. A notepad keeps your memos. And a calculator keeps your accountant honest.

How to communicate with a new universe. With geoWrite, you can rearrange your written words. Move blocks of copy. Cut and paste. And even display your text in fonts of different styles and sizes, right on the screen.

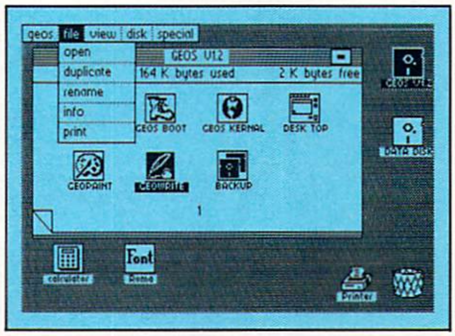
With geoPaint, you become a Michelangelo with a mouse.



Sketching and painting with all kinds of colors, textures and patterns.

You can invert, mirror and rotate images. Insert them into your geoWrite documents. And save them in your GEOS Photo Album for use later.

Finding your way through the universe. The most difficult



thing about a new universe is finding your way around. But with GEOS, you only need to remember two things:

Point and click.

When GEOS offers you options, you just point to your answers and click your mouse or joystick.

You want to draw? Point and click.

You want to write? Point and click.

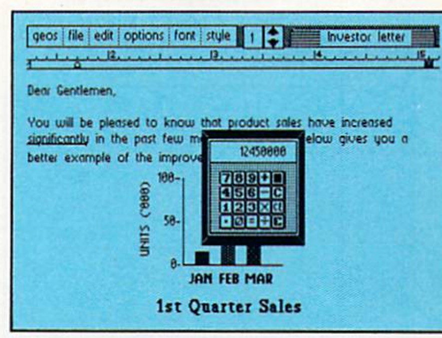
You want to fill in that obtuse rhomboid with an air-brushed geometric pattern in a lighter shade of pink? Point and click.

Easy, huh? And in case you ever do make a mistake, GEOS backs you up with an "Undo" feature that undoes the very last command you entered.

Running out of space. With GEOS, that's hardly likely. Because there's endless space in the universe for new applications.

Unfortunately, there's only so much space in this ad.

So zip down to your nearest software dealer. Tell him you want to explore the new universe in your Commodore.



And if he looks at you like you're some kind of alien, well, just tell him Berkeley Softworks sent you.

The name is universally known.

To order, call 1-800-443-0100 ext. 234

GEOS is just $59.95

(California residents add 6.5% sales tax.)
$2.50 US/$5.50 Foreign for shipping and handling. Allow six weeks for delivery.

Berkeley Softworks

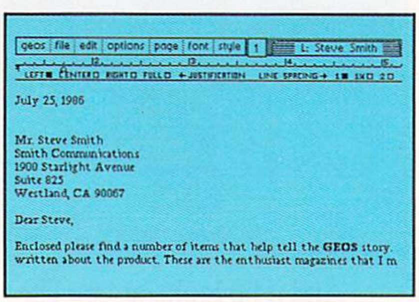
The brightest minds are working at Berkeley.

THE STRON
ARE BUILT WIT

Whether you're building an argument or just hammering out a memo, any project looks better when you put it together in Writer's Workshop. The supercharger that powers your GEOS-equipped Commodore through even the most wrenching assignments.

Sharpen your skills. The first thing to do in the Workshop is plug into geoWrite 2.0, which contains all the brand new tools you need to hone any rough concept into a well-crafted document.

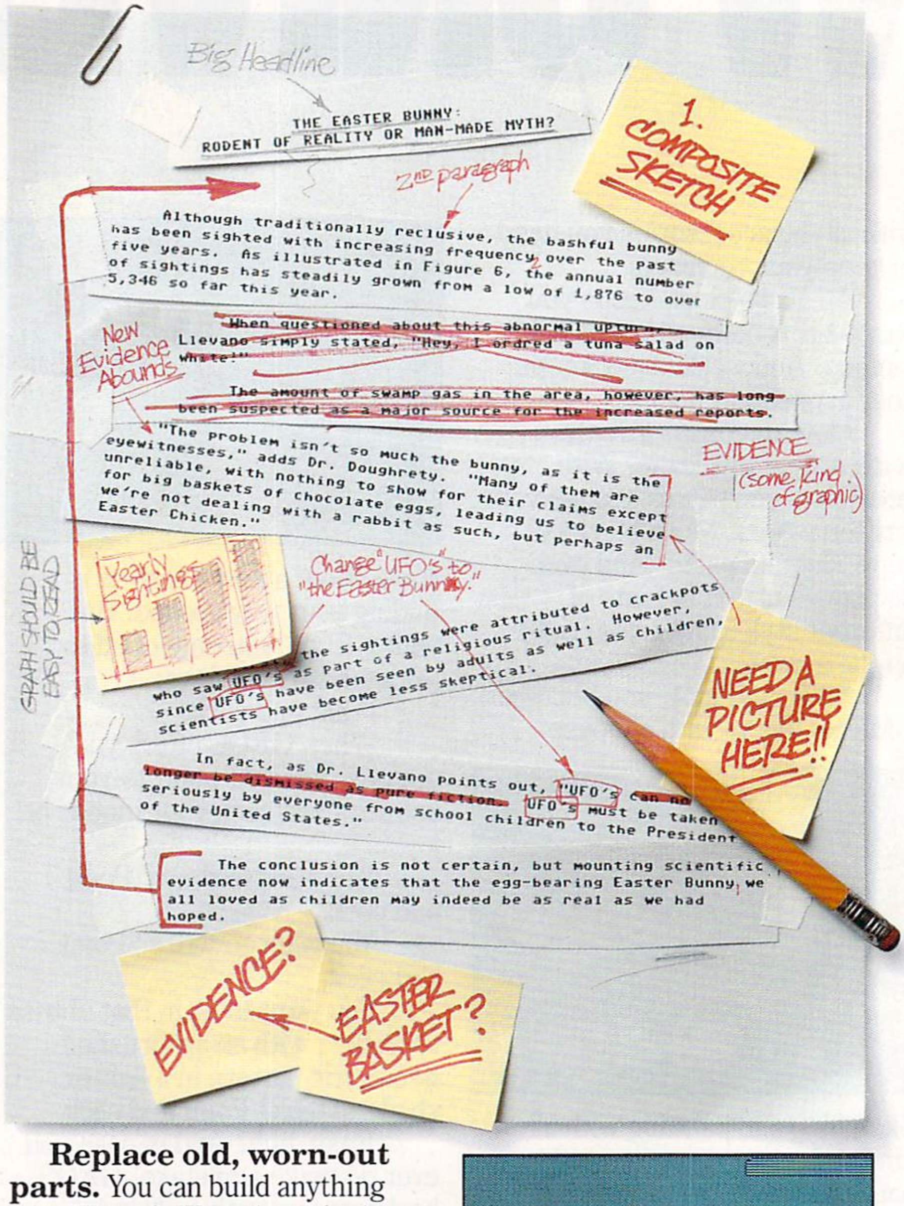
You get headers. Footers. Subscripts and superscripts. You can center your text. Right justify. Full justify. And nail



down formatting problems with variable vertical spacing and adjustable margins.

The Workshop cuts down on your manual labor, too. With one-stroke, "shortcut" keyboard commands. They keep your hands off the mouse so you can keep your mind on your work.

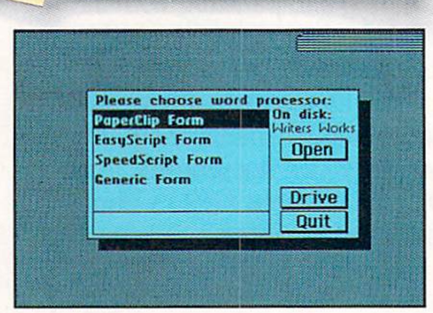
In fact, there's a complete set of heavy-duty accessories that not only strengthen your writing, but reinforce its structure, as well.



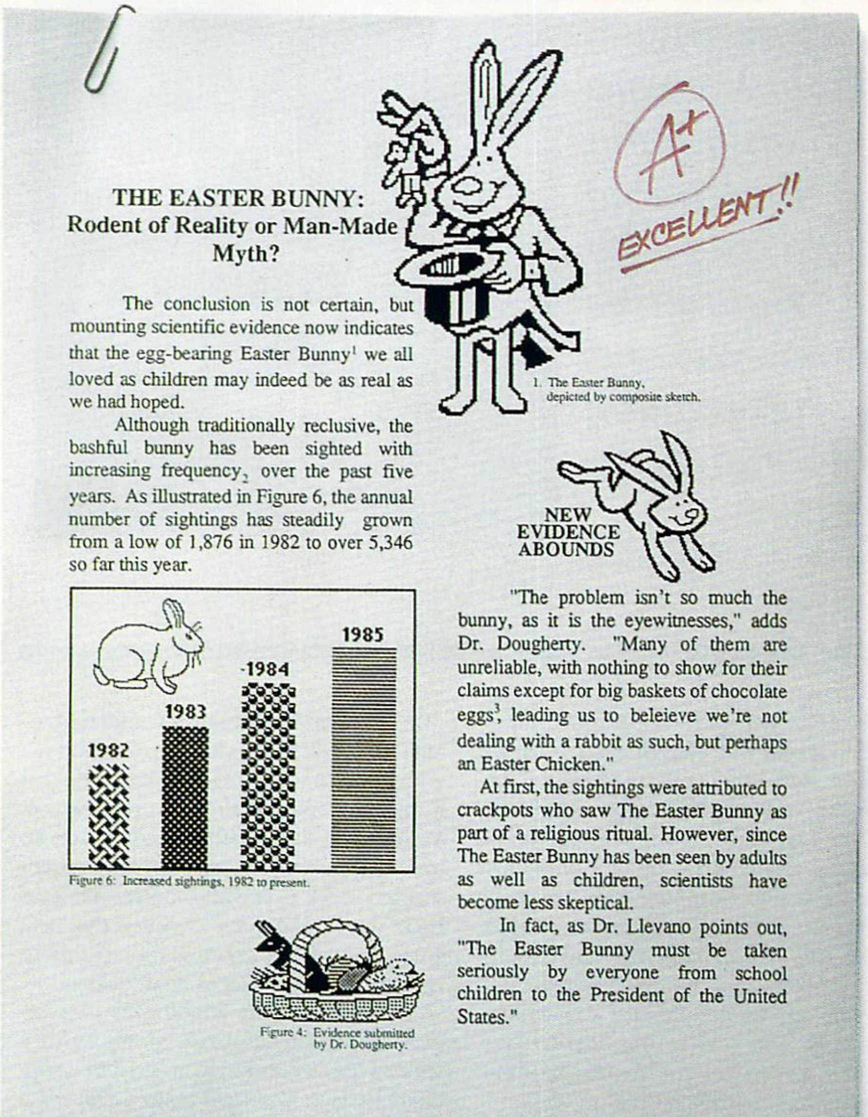
Replace old, worn-out parts. You can build anything with Writer's Workshop. And repair old stuff, too. Just decide which parts have to come out and which new ones go in.

Then hit the key and stand back.

Instantly, the "search and replace" drills through your old



GEST CASES
H A WORKSHOP.


THE EASTER BUNNY:
Rodent of Reality or Man-Made Myth?

The conclusion is not certain, but mounting scientific evidence now indicates that the egg-bearing Easter Bunny[1] we all loved as children may indeed be as real as we had hoped.

Although traditionally reclusive, the bashful bunny has been sighted with increasing frequency, over the past five years. As illustrated in Figure 6, the annual number of sightings has steadily grown from a low of 1,876 in 1982 to over 5,346 so far this year.

Figure 6: Increased sightings, 1982 to present.

1. The Easter Bunny, depicted by composite sketch.

NEW EVIDENCE ABOUNDS

"The problem isn't so much the bunny, as it is the eyewitnesses," adds Dr. Dougherty. "Many of them are unreliable, with nothing to show for their claims except for big baskets of chocolate eggs[3], leading us to beleieve we're not dealing with a rabbit as such, but perhaps an Easter Chicken."

At first, the sightings were attributed to crackpots who saw The Easter Bunny as part of a religious ritual. However, since The Easter Bunny has been seen by adults as well as children, scientists have become less skeptical.

In fact, as Dr. Llevano points out, "The Easter Bunny must be taken seriously by everyone from school children to the President of the United States."

Figure 4: Evidence submitted by Dr. Dougherty.

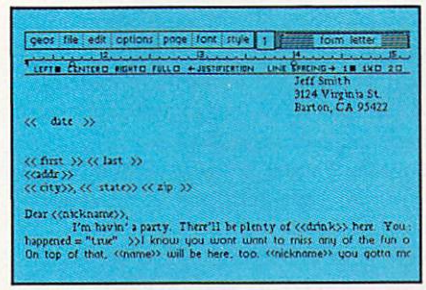
text, replacing worn-out words and phrases with your brand new ones.

For more serious cases, hand the job over to the Workshop's Text Grabber. It takes text from several word processors—like Paper Clip™—and lets you overhaul them with new GEOS fonts, formats and graphics.

A few more built-in features. Every project leaves the Workshop looking beautifully finished, too. Because it not only comes with LaserWriting compatibility, there's even a LaserWriter for you to print on.

You simply upload your files to QuantumLink.™ Then they're printed and mailed back.

Convenient, or what?



Of course, you don't want to keep good-looking documents like this to yourself. So we built in geoMerge. Which customizes your geoWrite form letters to people on your mailing lists.

So if your plans call for some real masterpieces, do something really constructive about it. Call your software dealer and requisition Writer's Workshop.

Who knows? You just might build a name for your self.

To order call 1-800-443-0100 ext. 234
Writer's Workshop $49.95
(California residents add 6.5% sales tax.)
$2.50 US/$5.50 Foreign for shipping and handling. Allow six weeks for delivery.

WRITER'S WORKSHOP
GEOS COMPATIBLE



Berkeley Softworks

The brightest minds are working at Berkeley.

REVIEWED BY MARK COTONE

Color Mail

Computer: Commodore 64
Publisher: Hallmark Cards
2400 Pershing Road
Kansas City, MO 64108
Medium: Disk/CompuServe
Information Service
Price: $40.00

Create and send electronic greetings—complete with animation and sound effects—with Hallmark's Color Mail *and a subscription to CompuServe.*



Hallmark Cards has taken the first step into a new form of communication: the electronic greeting card. With *Color Mail,* CompuServe subscribers can use the Commodore 64 computer to design and send customized salutations. These personalized notes transcend words by incorporating graphics, animation, music and sound.

No longer will CompuServe acquaintances be forced to acknowledge each other in the usual fashion. A simple "Thanks for the help, Harry," for example, can now be transformed into a full-blown visual production. Depict a local bar scene, decorated with colorful bouquets, festive banners, and a candle-topped cake. Invite some voluptuous video trollops and a couple of animated party animals to spark the mood. Propose a toast to Harry, set off some electronic fireworks, and direct the band to play an appropriate tune.

With extensive documentation, users may soon compose tailored C-Mailings in a fraction of the time it would take to sign, seal and deliver an enveloped counterpart. The process is simple. After you, the designer, have some idea of what you would like to say, you sift through a variety of available construction components, picking out the elements that might best fit your greeting. There is a sizeable assortment of both visual and audio options, separated into such "libraries" as Characters, Creatures, Backgrounds, Special Effects, Symbols, Sound Effects, and Music.

After the ingredients have been chosen, they're then taken to the Create Screen, where you are set designer, to position each prop and player. When the stage is set and everything is in place, animation, color changes, timed entrances and typed messages can be incorporated, giving the project movement, plot, and a personalized touch. A 55-page user's guide details the step-by-step creation process, and is accompanied by a reference card outlining the major commands.

After a greeting is completed, it can be sent and received by other *Color Mail* owners using CompuServe's EasyPlex electronic mail. A Vidtex program included on *Color Mail's* flip side and accompanied by its own comprehensive manual will help users upload and download messages. The cost to the dispatcher is just 25 cents over the regular CompuServe connect-time charge.

But periodic greetings aren't this product's sole appeal. To keep its *Color Mail* audience active, Hallmark has created a special on-line Exchange Forum, designed to initiate friendly correspondence with other C-Mailers. Centering around what is called a Connections Bulletin Board, users can post and receive text messages, plan greeting exchanges, and leave or take requests for special-occasion creations. For better or for worse, popular Forum members may never again have a birthday slip by unnoticed.

For the more artistically inclined C-Mailers, those who have the time and talent to create what they believe to be truly magnificent greetings, stories or scenarios, Hallmark offers the chance to have your composition permanently enshrined in the Color Mail Garret of Merit. Each week, Hallmark chooses the best entry from all the greetings sent to them via EasyPlex, and places it on display.

The author of the winning creation receives instant celebrity status with a short write-up, and is awarded a free supplementary *Color Mail* library. These additional libraries (which can be ordered and electronically downloaded by any C-Mailer) augment the 103 designing elements provided in the initial package, expanding the program's base and allowing for more specialized greetings.

If there is any truth to the adage that what's important is not what you say, but how you say it, then *Color Mail* might be one of the more impressive telecommunications tools available. Any greeting sent with the visual flair that this program packs is sure to get its message across. ■

ARE YOU SEARCHING FOR FRIENDS?

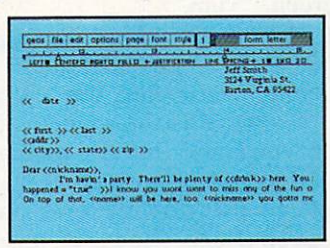


If you're finding it increasingly difficult to find anything at all, maybe it's time you found out about geoDex. The GEOS-compatible directory that generates mailing lists. Prints address labels. And sorts out all sorts of things for your Commodore.

Try directory assistance. With a little help from geoDex, you can call up a directory organized from any three categories you choose. Which means you can list your friends by name, telephone number or almost anything else that can be assigned its own three-character code.

Like "MEN" for guys you know. Or "GRL" for girls you know. Or "FOX" for girls or guys you'd like to know.

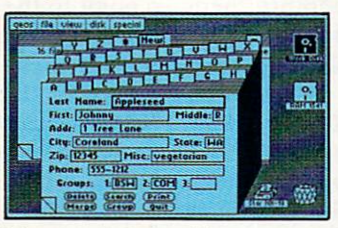
But no matter how you choose to categorize them, if you can point and click a mouse, you can call up any list of friends with geoDex's easy-to-read graphics.



Our most inviting feature. Of course, once you've gotten your friends organized, the next thing we recommend you do with geoDex is really very simple.

Throw a party.

You see, geoDex comes with geoMerge, a mail merge program that customizes form letters, announcements—even party invitations—with the names and addresses stored in geoDex. First you write the letter with geoWrite. Then you select a list from geoDex.



Put them both together with geoMerge and it's toga time!

The search is over. So if you're tired of looking for friends, waltz right down to your software dealer and ask him for geoDex. We can't guarantee it'll win you more friends, but it'll certainly keep you from losing them.

To order call 1-800-443-0100 ext. 234

geoDex $39.95

(California residents add 6.5% sales tax.)

$2.50 US/$5.50 Foreign for shipping and handling. Allow six weeks for delivery.

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GEODEX GEOS COMPATIBLE



Berkeley Softworks

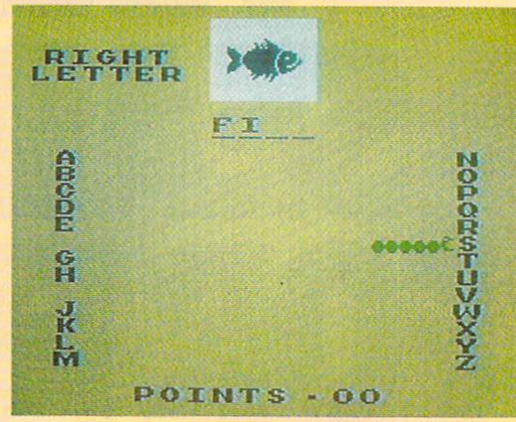
The brightest minds are working at Berkeley.

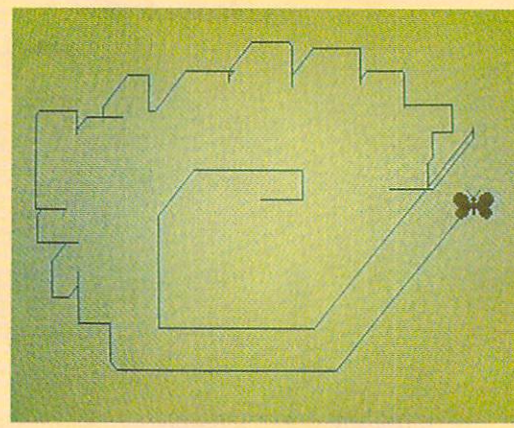
REVIEWED BY JACK EMBERLY

ABC Caterpillar

Computer: Commodore 64
Publisher: Intelligence Quest Software
Avalon Hill
4517 Harford Road
Baltimore, MD 21214
Medium: Disk
Price: $20.00

With a little thoughtful adult intervention and guidance, ABC Caterpillar *can also help children learn to recognize both upper- and lower-case letters quickly.*





As the letter "A" crept from right to left across the screen, Thomas pushed the joystick forward, maneuvering the ABC Caterpillar into its path. The first letter of the alphabet had been recognized and captured. Relentlessly, the insect's jaws munched on the letter A until it had been gobbled off the screen. The A then reassembled itself at the top left-hand corner of the screen. A new array of letters now paraded from right to left. Among them was a B. My first-grade friend found it too, and had it gobbled up. Similarly, B appeared next to A in the top left corner of the screen. "Yum, yum," Thomas declared, licking his lips, "I'm eating the ABC's."

Thomas' digestion of letter names is the first major step in becoming a successful reader. Children who know the sounds of letters should also know the names we apply to them. This fact could well have given rise to alphabet soup. Moms and dads may not understand the appeal of munching on a D or an M, but who cares? If eating them helps the kids learn their ABC's, why not encourage it?

That's the thinking behind *ABC Caterpillar,* a beginning reading program whose "munch" caterpillar rivals soup as an effective letter-identification activity. With a little thoughtful adult intervention and guidance, *ABC Caterpillar* can also help children learn to recognize both upper- and lower-case letters quickly. But that's not the only objective of this program. To a large extent, *ABC Caterpillar* will also provide practice and reinforcement of some subsequent phonics skills which are usually taught from the beginning of grade one well into grade three.

ABC Caterpillar has four parts. The first, the Alphabet Game, begins with the choice of upper- or lower-case letters presented in one of three speeds. Tom felt most comfortable with level one, the slowest tempo. However, level three (fast) is an exciting test of eye-hand coordination and letter recall once the youngster has gained experience with the game.

In this section, letters move across the screen as the child employs the "munch" caterpillar to capture them in correct sequence. Tom and I thoroughly enjoyed the Alphabet Game, though I was a little disappointed with the unimaginative use of sound. Hearing eight uninspiring notes over and over again worked on my nerves. For Thomas, however, the program's intended client, that issue was irrelevant.

The remaining sections of the disk are a bit less powerful instructionally, but still valuable for practice and reinforcement of subsequent phonics skills. Section two, First Letters, presents pictures of common objects and asks the student to determine the first letter in a word for that object. For example, the image of a dog might appear at the top of the screen. The student's task would be to deduce the first letter in dog. To do this, the student has to say "dog" to him or herself, detect and separate the "D" sound at the beginning of the word, equate that sound to the letter name "D," then press the D key as the answer. Recognizing "D" for "dog" adds a point to the child's score.

Sections three and four, the letter word-games, are closely related encoding or "blending" activities. In the first, the student fills in three blank spaces with the letters that spell a word. Again, a picture tells the user what word to spell. All 26 letters appear in two vertical columns on either side of the screen. The student examines the picture, for example, of a cat, determines mentally the three sounds or phonemes in "cat," then directs the caterpillar to the right letters and "munches" them in the correct order. As the munching ends, the

Continued on pg. 122

THE STANDARDS
by which the others are judged...

NEW
THE EXECUTIVE DISK #1
Two new 18 hole courses for use with LEADER BOARD. Trees, sand traps, rough, water hazards.
$19.95 C64/128 ONLY



TOURNAMENT DISK #1
Our new 18 hole courses for use with LEADER BOARD.
$19.95 C64/128, AMIGA ATARI ST, ATARI(48K)

MACH 5
Increase the power of your C64 and 1541 drive. Loads programs up to 500% faster. Adds easy-to-use DOS commands.
$34.95 C64



MACH 128
All the power of MACH 5 for the C128 and C64. Features 64 and 128 select switch, warp drive and more!
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AMIGA SCREENS

LEADER BOARD
Pro Golf Simulator
$39.95 C64/128, AMIGA, ATARI ST, ATARI(48K)

"This game is simply amazing—there's no other word for it!"
COMPUTE'S GAZETTE

"...the next best thing to a sunny day on the fairways..."
AHOY MAGAZINE

"...the sports simulation of the year, if not the decade!"
ZZAP! 64 (U.K.)

NEW
10th FRAME
Pro Bowling Simulator
The look and 'feel' of real bowling. Up to eight players including league play.
$39.95 C64/C128 (Coming soon for ATARI ST and AMIGA)





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BODYLINK™

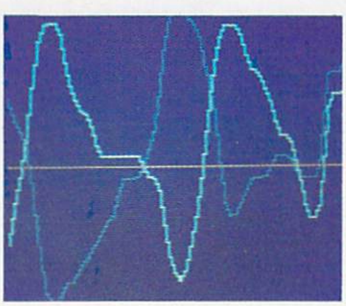
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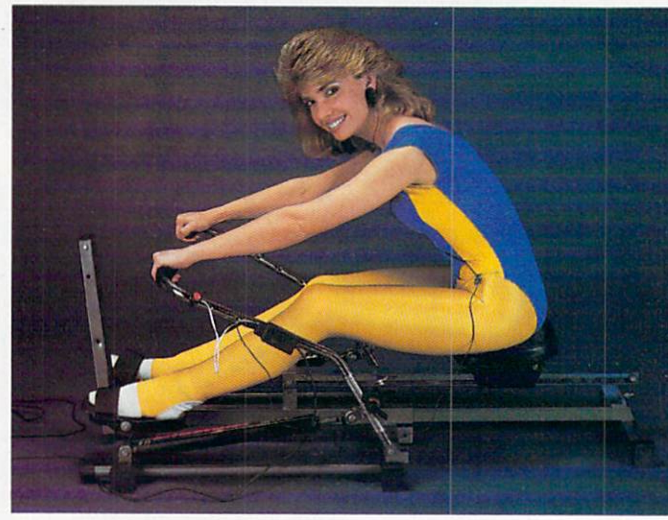
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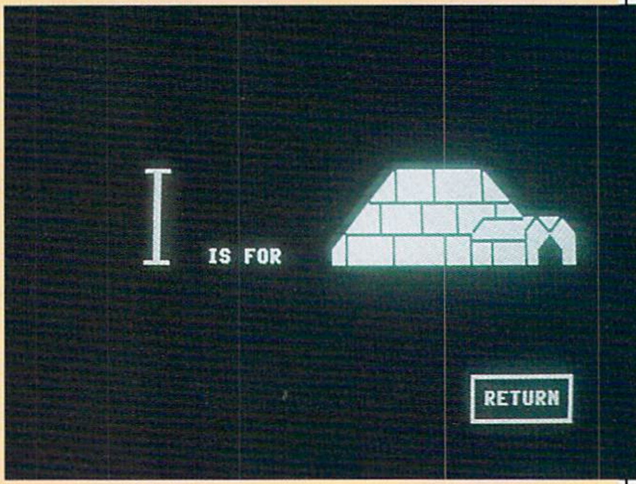
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REVIEWED BY JACK EMBERLY

Mrs. Mac's Consonants and Mrs. Mac's Short Vowels

Computer: Commodore 64
Publisher: Mrs. Mac
2020 Lenester Avenue
Ottawa, Ontario
K2A 1K5 Canada
Medium: Disk
Price: $30 each

Both programs teach phonics quickly and enjoyably.

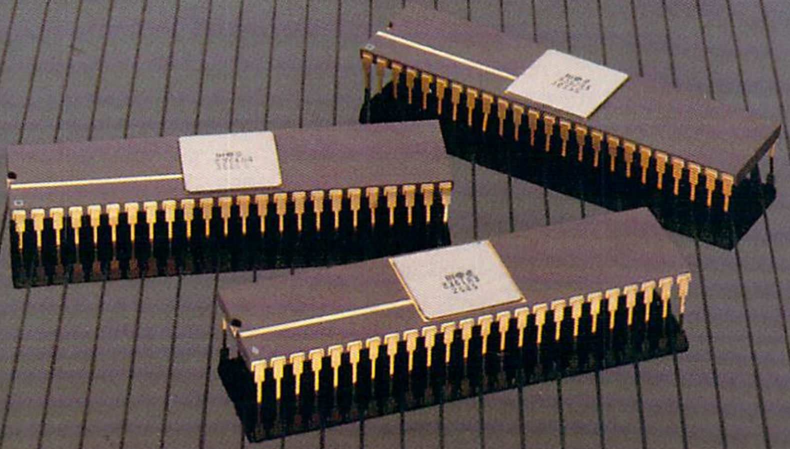


Sounding out one-syllable, short-vowel words is not the first stage in learning to read. Well before Kyler, my grade-one friend, could decode the printed word "cat," he had labored over prerequisite skills and concepts. First, he had mastered letter names, and learned to recognize their upper- and lower-case forms. Then he learned to connect the sounds of letters with their printed forms. Understanding this allowed Kyler to hear whole words and determine whether individual sounds occurred at their beginning or end. This was essential before Kyler was able to read and recognize that c-a-t spells cat.

Mrs. Mac's Consonants

Mrs. Mac's Consonants teaches phonics at the very beginning: the sound-symbol relationships of the 21 letters we call consonants. Teachers of kindergarten and grade-one students will like this ma-

Continued on pg. 36



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GIVES YOU A CREATIVE EDGE.

Continued from pg. 34

terial for its strict adherence to instructional design, and parents of students between the ages of four and seven will certainly want to add *Mrs. Mac's Consonants* to their home education library.

Mrs. Mac's Consonants is popular with the children, too. Bright, animated graphics of familiar animals and objects from cats to rockets fill the screen. Rockets blast off and ships steam. The creative use of sound makes things even more exciting. For instance, the bell to introduce the B consonant rings clamorously, and the chick that demonstrates CK cheeps.

The 21 consonants are divided into seven progressively more comprehensive modules. Module one introduces only three consonants. A single colorful graphic appears on the screen, perhaps a pair of socks, a table, or a coffee mug. To the right of this graphic the letters S, M and T appear. Underneath these is a blank line with a question mark. The child responds by selecting the correct letter, typing it, and pressing the RETURN key. A correct response results in the letter reappearing in a variety of imaginative visual patterns. After mug, for example, a giant M fills the screen. At other times, a lower-case s, m or t align themselves in creative patterns to form images of the host letter.

Module one's limit of three consonants is exactly what Kyler needed as he entered school in September. During kindergarten, he had been familiarized with letter names and sounds, but he hadn't really mastered any of them. His command of letter names extended only as far as his ability to sing the ABC song, and even that recital wasn't flawless.

A good review helped associate the sounds with the names of letters. Starting with just a few consonants took the pressure off and allowed thoughts to flow. Identifying the initial sound of a word helped him understand that sounds are different from whole words because they are smaller components of them.

In the second module, five consonants are introduced while those in Module one are reviewed. This time, however, whole words appear on the screen with the first letter missing. For example, a picture of a dog may accompany the incomplete word dog. The graphic immediately told Kyler what the word had to say. By listening to his own enunciation of dog, he determined that the sound D occurred at the beginning of his spoken word. Having determined that D was the target, Kyler matched it with its printed form from the choices provided.

Modules one and two increased Kyler's ability to analyze his speech for specific sounds, but occasionally after finding the sound, he was unable to relate it to a letter name. Module three seems to have anticipated this temporary impasse. It begins with a musical recital of the ABC tune as the alphabet appears on the monitor screen.

Module three's letters are introduced as the first letter of each word. Whole sentences also make their appearance underneath some of the completed words. Reading these sentences with Kyler helped him see how the spaces between words marked the end of one and the beginning of another.

Discriminating sounds at the end of words was a new challenge for Kyler, but module one had helped prepare him,

Continued on pg. 120

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Tips & Tricks

Hints for Fun and Utility

COMPILED BY LOUIS F. SANDER

This January we welcome the many new readers whose Christmas was brightened by a Commodore computer. As always, our material includes valuable and interesting tips for computerists new and old, carefully selected from the hundreds of items we get each month. We try to be the very best source of hints and tips for computing, and if our mail is any indication, we succeed. So newcomers and oldtimers, dig into our gold mine—you're sure to find some nuggets that will delight you.

Mind Reader: Your Commodore 128 has a mind of its own. Run this program to see its innermost thoughts.

Louis F. Sander
Pittsburgh, Pennsylvania

128 Mind Reader

```
10 REM * MIND READER - LOUIS F. SANDER
20 PRINT CHR$(147);TAB(209);TAB(211);
30 FOR J=16 TO 1 STEP-1
   :PRINT CHR$(ASC(MID$
   ("REQYL$WM$VVI$SX$",J,1))-4);:NEXT
40 PRINT TAB(253);TAB(249)
```

Disk buyer's guide: If you're confused about what sort of disks to buy for your Commodore, this will help you. I discuss disks in general, and make specific recommendations on what to buy. While there are many specifications for disks, the most important ones refer to number of sides, density and type of sectoring.

Many disk drives, such as the Commodore 1541, have only one read-write head, which writes on the bottom side of the disk. Others, like the 1571, have *two* heads—one on the bottom and one on the top. Disk manufacturers sell single-sided disks and double-sided disks, one for each type of drive. The manufacturing process is identical for both, but single-sided disks are only tested on one side, while double-sided disks are tested on both. Because of the extra testing, double-sided disks are a little more expensive, but the price difference is decreasing. At this writing, the difference is only about 10% at many stores.

If you have the 1571, which is a double-sided drive, you should always buy double-sided diskettes. If you have a 1541, you can buy either the single-sided or double-sided variety. Considering the small price differential and the fact that you may want to upgrade someday, double-sided disks are often the wiser choice.

When floppies first came out, they had a certain capacity for information storage, which matched the requirements of the equipment of the day. Then the equipment improved, and the new drives could record twice as much information per square inch of disk surface, *if* the disk was capable of storing it. To accommodate the new drives, disk manufacturers introduced higher-quality disks, which they called double-density to differentiate them from the older product. Because of their higher quality, they could be used on either the old or the new drives. Later on, special quadruple-density disks began to be made. Today, the double-density disk is by far the most common in the marketplace. Single-density disks are almost never found, and the special quad-density disks are uncommon.

Commodore drives are made for double-density disks, so that's what you should buy. Single-density disks will often work, but there's a chance they won't. Quad-density disks are designed for special drives, and may not work at all in your Commodore. My recommendation: Always use double-density disks.

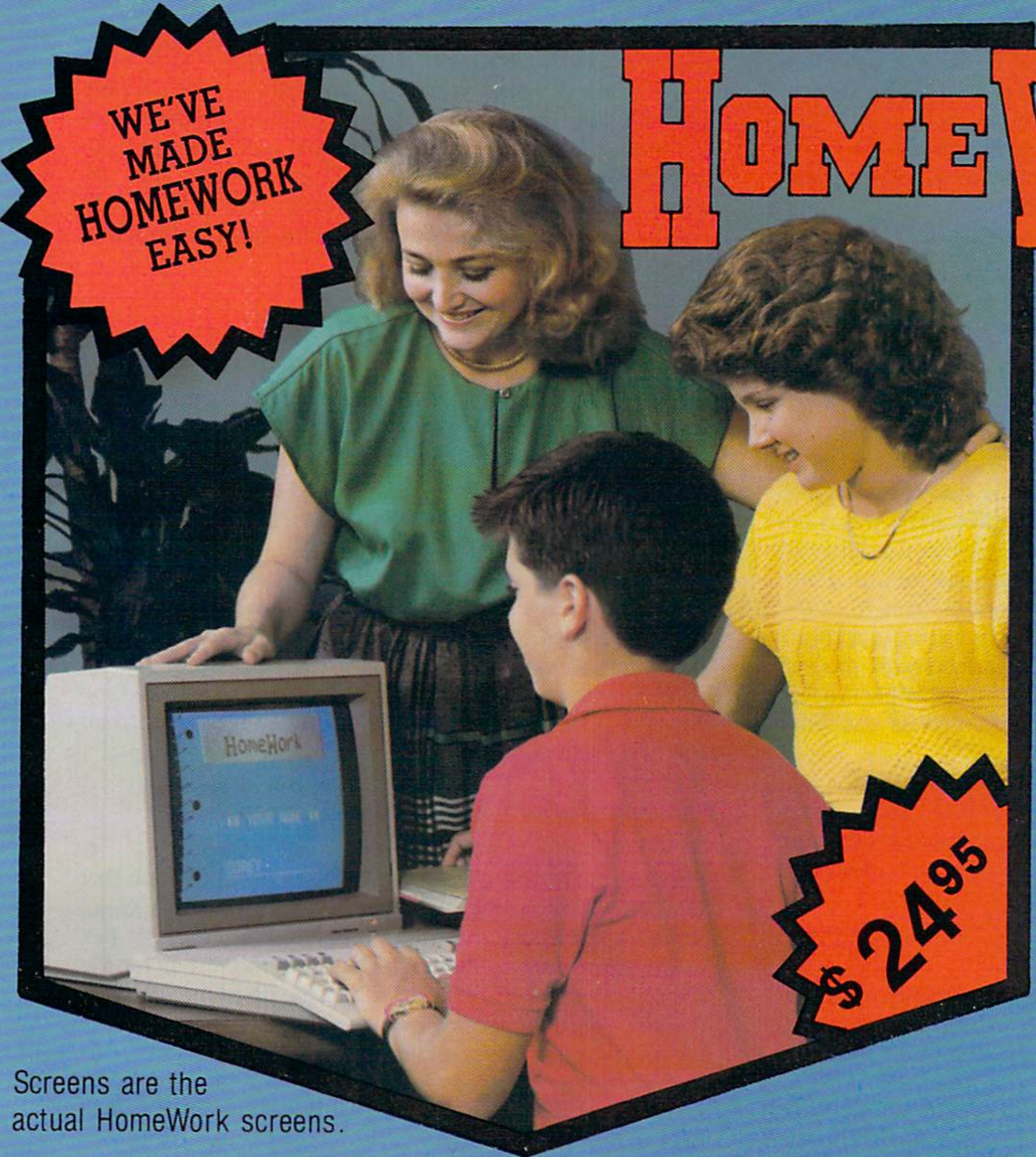
Sectoring is either hard or soft, and refers to the number of little holes punched in the rotating part of the disk. Soft-sectored disks have only one hole, while hard-sectored disks have several, and you can use either kind in your Commodore drive. (Commdore drives don't use the holes!) Soft-sectored disks are the least costly and most readily available, so the choice is easy.

There are many brands of disks, and some can be more than twice as expensive as others. I have used all kinds at great length, and have never had a problem with even the cheapest disk; the poorest one is a very high-quality item, and perfectly satisfactory for Commodore computing. Nevertheless, I stick to name-brand disks for my own purchases, because I don't want to take any chances.

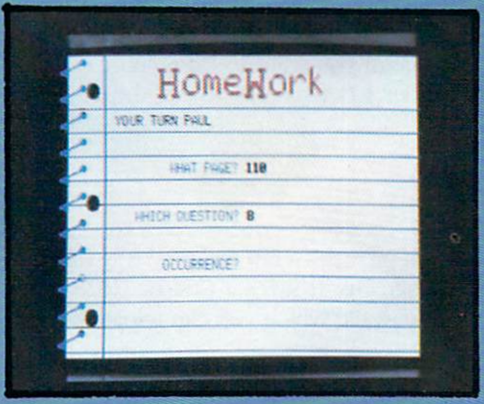
Louis F. Sander
Pittsburgh, Pennsylvania

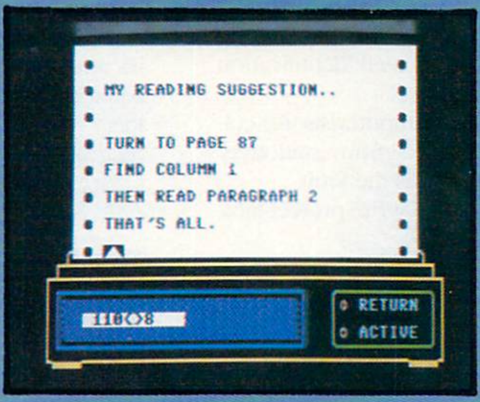
Continued on pg. 40

HomeWork



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Continued from pg. 38

Disk flipping: If you have a 1541 or other drive that only uses one side of the disk, here's an old trick for using the other side. All you do is to cut another write-protect notch just opposite the old one in the area where the manufacturer's label is usually placed. Using another disk for a template, make a penciled outline of the notch, then cut it out with a razor blade or delicate pair of scissors. Be careful not to go outside the lines, or you might ruin the disk by cutting into the rotating part.

Once your new notch is complete, you can insert the disk upside down (oval read-slot first, manufacturer's label down) and format it like a brand new disk. You now have the equivalent of two disks, with two directories, one on one side and one on the other.

There are some dangers inherent in this trick, and you need to be aware of them. The flipped disk rotates in the "wrong" direction with respect to its jacket, and it wasn't designed to do so. Neither was it meant to have its flip side written on, especially in the reverse direction. For these and other reasons, there's a chance you'll lose some data from the second side of the disk. Nevertheless, many computerists accept the risk, and most of them report perfect results from all their "flippy" disks. Because of the risk, some people use flippies only as back-ups, or for programs whose loss would not be serious.

You should be very careful when using a double-notched disk in a 1571 or other double-sided drive. These drives write on both surfaces of the disk, no matter which side is up, so it's easy to make a mistake that overwrites the "other" side.
Kathleen Mead
Westerville, Ohio

Disk tabs and labels: When you buy a box of disks, it usually contains a modest supply of labels and write-protect tabs. Here are some suggestions on using them and replacing them when they're gone.

Some people code their disks by the position of their labels. For example, games disks could have the labels on the right, word processing disks in the center, and utilities disks on the left. If you combine this technique with color coding via the labels, you can have a very sophisticated identification system.

And speaking of color coding, many computerists use colored electrical tape or the colored dots from stationery stores for that purpose. Your imagination is the limit.

You can also use electrical tape to make write-protect tabs. A single roll makes dozens of tabs.

When you run out of disk labels, check your office supply store's selection of general purpose labels. These are available in many sizes and colors, and for a few dollars you can purchase a long-term supply. I've had good success with the sheets of mailing labels designed for copy machines—they are the right size, they adhere well to the disks, and one box holds over 2,000 labels.
Roland Stone
New York, New York

Disk storage: While there are many special boxes for storing and transporting disks, common containers will often do the job for much less money. Take a few disks to the kitchen department of your discount store, and you're sure to discover some inexpensive alternatives, some with air-tight seals.

An especially useful kitchen product is the Zip Lock™ sandwich bag, which perfectly holds one or more disks while protecting them from dust and fingerprints.

Wherever you keep your disks, it's useful to keep a supply of labels and write-protect tabs as well. I cut the tops from two 6-inch by 9-inch mailing envelopes, making smaller envelopes 6 inches wide and about 5 inches high. They are about the size of disks, and they fit nicely in the back of my disk file, where one holds labels and the other holds write-protect tabs.
Margaret Ittel
Los Angeles, California

Disk mailers: It's not safe to mail a disk unless it has some protection from being folded by an aggressive postal worker. Commercial mailers are serviceable but expensive, and they aren't always strong enough to withstand determined folding.

A very rugged mailer can be made from two squares of corrugated cardboard, slightly larger than a disk. Line them up so their corrugations are at right angles to each other, then put the disk between them like the meat in a sandwich. Tape on all four sides completes a package that is almost impossible to bend, and that's safe in an ordinary envelope.

Another strong one can be fashioned from styrofoam. Tape your disk to a 1-inch-thick piece, put it in an envelope, then dare the mailman to bend it.
Billy Dew
Montreal, Canada

Loading from the directory: Here's another old one that we'll pass along to the newcomers. If your directory is on-screen, you can use it to make program loading easier. Just move your cursor to the line of the directory listing for the desired program, and type LOAD in the first four spaces of the line. (You'll be writing over the digits for the number of blocks in the file.) Then use the cursor right key to move part the quote just after the file name, and type a comma, the number 8, and a colon. Press RETURN and your program will load automatically!

Like so many useful tricks, this one is easier to do than to describe. Try it once and you'll see how easy it is. And yes, if it's a machine-language program you want to load, you can add a comma and the number 1 between the 8 and the colon.
Maged Abdel Wadood
Cairo, Egypt

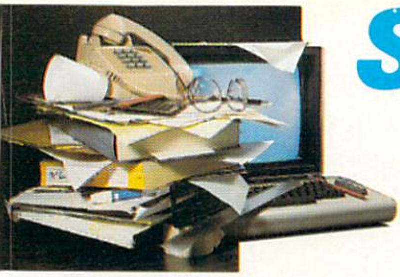
Screen saver: This program provides a fast and easy way of saving and displaying text screens. It saves a C64 or C128 text screen as a four-block disk file which you can reload at any time.

When the program is run, you will be prompted to input a file name for the screen to be saved. Enter the file name and press RETURN, and the screen will clear with a flashing cursor in the home position. At this point, just type the screen you want to save, using any of the keyboard keys except RETURN and the color keys. When you are finished, press RETURN and the screen will be saved under the name you previously assigned it.

Once the screen has been saved, you can display it by typing

LOAD "filename",8,1 where "filename" is the name under which you have saved the screen.
Michael McCurdy
Ann Arbor, Michigan

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by Ronald Peterson
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Continued from pg. 40

Tips & Tricks

Screen Saver

```
1Ø PRINT"[CLEAR,SPACE2]
   SCREEN SAVER - MICHAEL MCCURDY"
2Ø PRINT"[DOWN]FILENAME:";:OPEN 1,Ø
   :INPUT#1,S$:IF LEN(S$)>16 THEN 1Ø
3Ø PRINT"[CLEAR]";:INPUT#1,A$:CLOSE 1
4Ø OPEN 2,8,1,S$:PRINT#2,CHR$(Ø);
   CHR$(4);
5Ø FOR J=1Ø24 TO 2Ø23:PRINT#2,
   CHR$(PEEK(J));:NEXT
6Ø CLOSE 2
```

Home-made fanfold: When feeding single sheets into my printer, I used to bypass the out-of-paper switch with another sheet of paper, which was really quite a bother. Now I chain the single sheets together with the new removable type of Scotch™ tape. It's available in any store, and it peels off without tearing or leaving any marks.
Don Smith
Wheaton, Maryland

Daisy wheel ribbon hint: Commodore's DPS1101, like many other letter quality printers, uses a standard IBM Selectric II ribbon cartridge, available at most office supply stores. There are many varieties of Selectric II ribbon on the market, with prices that vary widely; not all of them are suitable for your printer. The store clerk can help you choose the right one, probably after consulting a catalog. In the meantime, here's an overview of the most important features.

The least costly ribbon has a pink knob and pink leader. With each strike of the daisy wheel it advances one full character. Since the ribbon advances so fast, the cartridge has a rather short life. This ribbon's print quality is extremely sharp—sharper, in fact, than that on most office typewriters.

A better ribbon for most computerists is the more costly variety with a blue knob and blue leader. This ribbon advances only a fraction of a character with each strike, giving a five to ten times greater ribbon life. (It's not five to ten times more expensive.) The print quality, while not as sharp as on the pink-knobbed ribbon, is as good as that on most office typewriters. I prefer it for most purposes, since it looks a lot more "normal."

The most common ribbons are the so-called "correctable" varieties, with orange or yellow knobs and leaders. You probably don't want to buy these, since your printer can't take advantage of their correctability, and they aren't designed for long life.
Louis F. Sander
Pittsburgh, Pennsylvania

Simplest C64 word processor: If you don't have a word processing program, you can still print letters and other simple documents on your printer. Create the document as you would a BASIC program, entering each line as a number followed by whatever text you want to print. Don't use PRINT or any other BASIC statements—what you type is what you will get. (Don't use any question marks either, since the computer will interpret them as PRINT statements.) You can change lines, delete and insert them, or anything else you could do with a real program.

When everything is as you want it, just type

POKE 22,35 : OPEN 4,4 : CMD4 : LIST

This will list your bogus "program" to the printer, but without the line numbers. When the printer stops, enter

PRINT#4 : CLOSE 4 : XXX

to return everything to normal. The XXX will give a syntax error, which will restore the line numbers. Be careful when typing PRINT#4—you cannot use the question mark as an abbreviation for PRINT, and you cannot include any spaces.
Todd Bruss
Hartford, Wisconsin

Automatic paragraph numbering: When creating a document on your word processor, it's often desirable to number paragraphs or other sections of your work. But when you use the word processor to move a section from one place to another, the numbering gets out of sequence and you have to correct it manually. Not only is this a nuisance to do, but it's an invitation for errors to creep into your otherwise perfect work.

But it's easy to get your word processor to do the numbering for you, and, of course, it never makes mistakes! The secret is to pretend that your document is a form letter, and establish variable blocks wherever the numbers are to appear. When outputting the text to the screen or to the printer, link your file to a variable data file filled with consecutive num-

Continued on pg. 44

NUMBER ONE ARCADE HITS...



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Continued from pg. 42

bers. (Mine is titled "NUMBERING.")
Walter R. Beardsley
Santa Maria, California

Telephone extensions: If you are tired of moving your computer to the nearest phone jack just to use your modem, you should try installing a semi-permanent extension cord. Parts for such a cord are readily available at Radio Shack and elsewhere, and making it up is easy. Just get the proper connectors and a roll of wire, then make up your cord. It's helpful to use rubber coated staples (Radio Shack 64-2876) to fasten the wire to the baseboard.
Tim Weiss
Address Unknown

On-line reading practice: I use QuantumLink's on-line encyclopedia as a source of reading practice for my seven year-old. The on-screen letters are large, the material is fascinating, and I can choose a subject he's interested in. When he's doing this reading, not only is he enjoying himself, but he's also learning about reading, computers, and whatever encyclopedia subject he's working with.
Bobbye Haupt
Newark, Delaware

C128 Easy Player: Here's a short but powerful program that lets you explore the C128's PLAY statement. Run it, then start pressing keys. If the PLAY statement can interpret a key, the program will make it do so; if your key is illegal in a PLAY statement, the program will give you an error message. Press A, and an A will sound. Press T then 3, and subsequent notes will sound in the "drum" envelope. It works on everything but sharps and flats, and it's lots of fun to use.

Want to learn about computer music? Open your system guide to the description of the PLAY statement, then use the program to check out the different elements. Before long, you'll feel like a byte-sized Beethoven.
Louis F. Sander
Pittsburgh, Pennsylvania

128 Easy Player

```
10 REM 128 EASY PLAYER - LOUIS F.
   SANDER
20 TRAP 30:GET KEY A$:PLAY"M"+A$
   :GOTO 20
30 IF ER=30 THEN END:ELSE PRINT"BAD
   KEY!":RESUME 20
```

Musical staff display: This is for you dabblers in computer music. It displays a musical staff with the octave numbers for each note. 2C, for example, indicates octave 2, note C. You can use this notation directly on the C128, or as a guide to preparing pokes for the C64.
Louis F. Sander
Pittsburgh, Pennsylvania

Musical Staff

```
100 REM * PUTS MUSICAL STAFF ON SCREEN
110 POKE 53280,15:POKE 53281,15
120 PRINT"[CLEAR,WHITE]
    "TAB(5)"MUSICAL STAFF - LOUIS F.
    SANDER [HOME]"
130 FOR J=1 TO 2:FOR K=1 TO 5
    :PRINT"[BLACK,DOWN] [SHFT *38]"
140 NEXT:PRINT"[DOWN,SPACE2]----";
    :IF J=2 THEN PRINT"[HOME]";
150 PRINT:NEXT:PRINT"[HOME]"
    :FOR J=1 TO 24
160 READ N$:PRINT TAB(39-3*J-36*(J>12)
    );N$;:IF J=24 THEN PRINT"[HOME]";
170 PRINT:NEXT:PRINT"[HOME]";
180 DATA"[RED]3G",3F,3E,3D,3C
190 DATA"[BLUE]2B",2A,2G,2F,2E,2D,"2C
    [BLACK]"
200 DATA"[RED]1B",1A,1G,1F,1E,1D,1C
210 DATA"[BLUE]0B",0A,0G,0F,"0E[BLACK]"
```

C64 screen effect: Run this little program to see an interesting special effect. Press STOP to stop it. If you add other lines to the end of the program, they'll execute when the effect is stopped.
David Brown
Address Unknown

64 Screen Effect

```
10 REM * 64 SCREEN EFFECT - DAVID
   BROWN
20 SA=49152 :REM RELOCATABLE START
   ADDR
30 FOR J=0 TO 24:READ K:POKE SA+J,K
   :CS=CS+K:NEXT:IF CS<>3953 THEN
   PRINT"ERROR!":STOP
40 DATA 200,140,033,208,140,032,208,
   162
50 DATA 094,202,016,253,165,203,201,
   063
60 DATA 208,238,165,203,201,064,208,
   250
70 DATA 096
80 SYS SA
```

Keyboard curiosity: Almost everybody knows you can switch between the two Commodore character sets by pressing SHIFT and the Commodore key at the same time. For an unusual surprise, depress RUN/STOP and hold it. Then while it's down, simultaneously press SHIFT and the Commodore key.
Gilbert Figueroa
Hollis, New York

Efficient numeric files: When numbers are saved to disk files, the operating system first converts them to strings, which are normally separated by CHR$(13)'s so they can be retrieved by the INPUT# statement.

But if your numbers are integers between 1 and 255, there's a much more efficient way to save them. If the number to be saved is N, for example, use

PRINT#2,CHR$(N);

to save it, and use

GET#2,A$: N=ASC(A$)

to retrieve it. The savings in disk space are phenomenal, since each number is saved as a single byte on the disk, without any extra delimiters.
Art Kohn
Duke University
Durham, North Carolina

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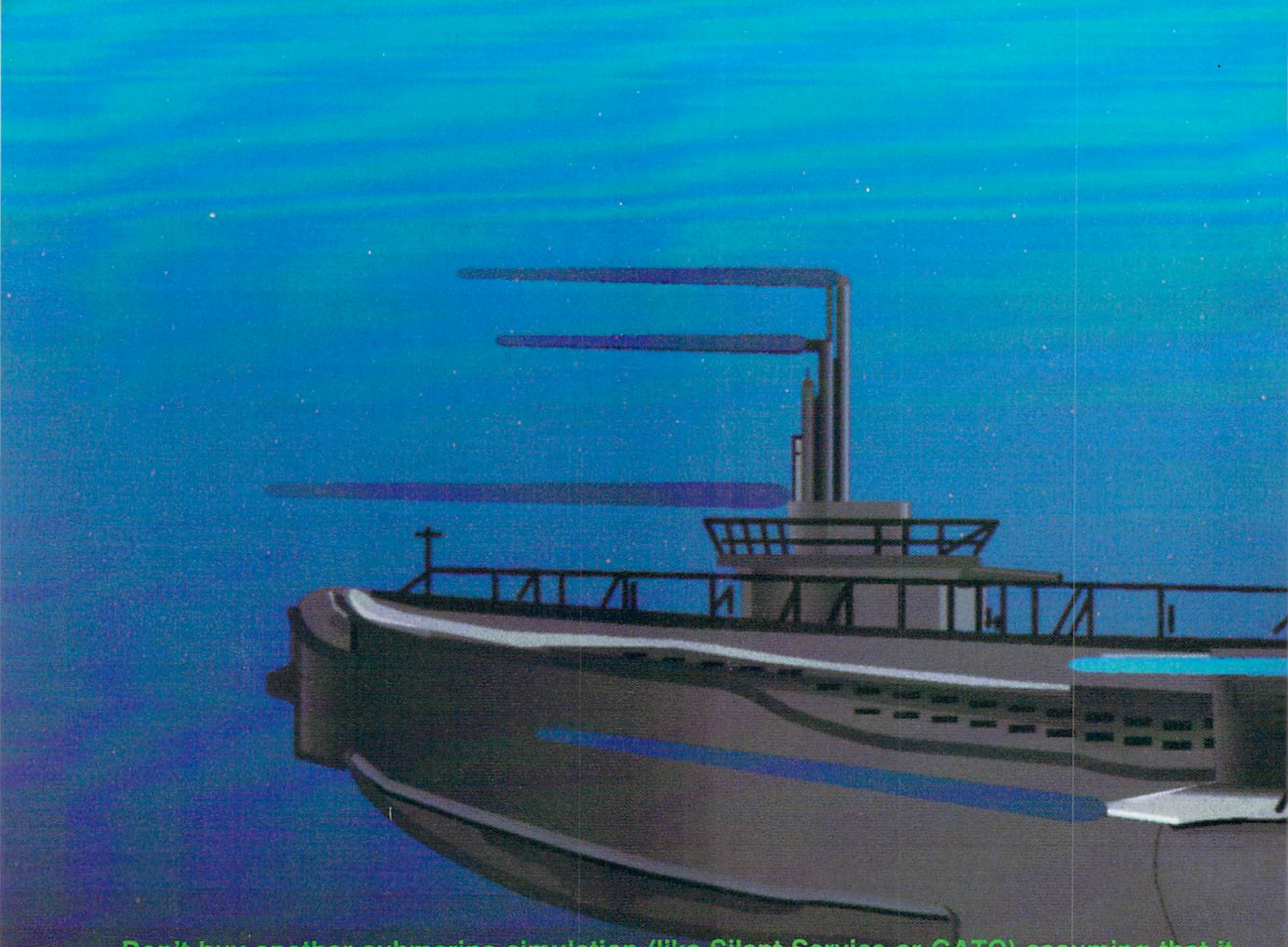


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Strategy

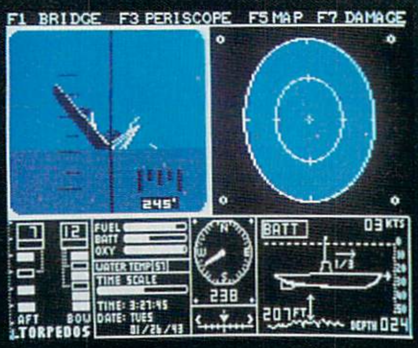
You command a WWII fleet class submarine. Patrol the Atlantic and Pacific theatres of war. Take your orders from COMSUBPAC (Commander Submarine Force Pacific), or go hunting on your own.

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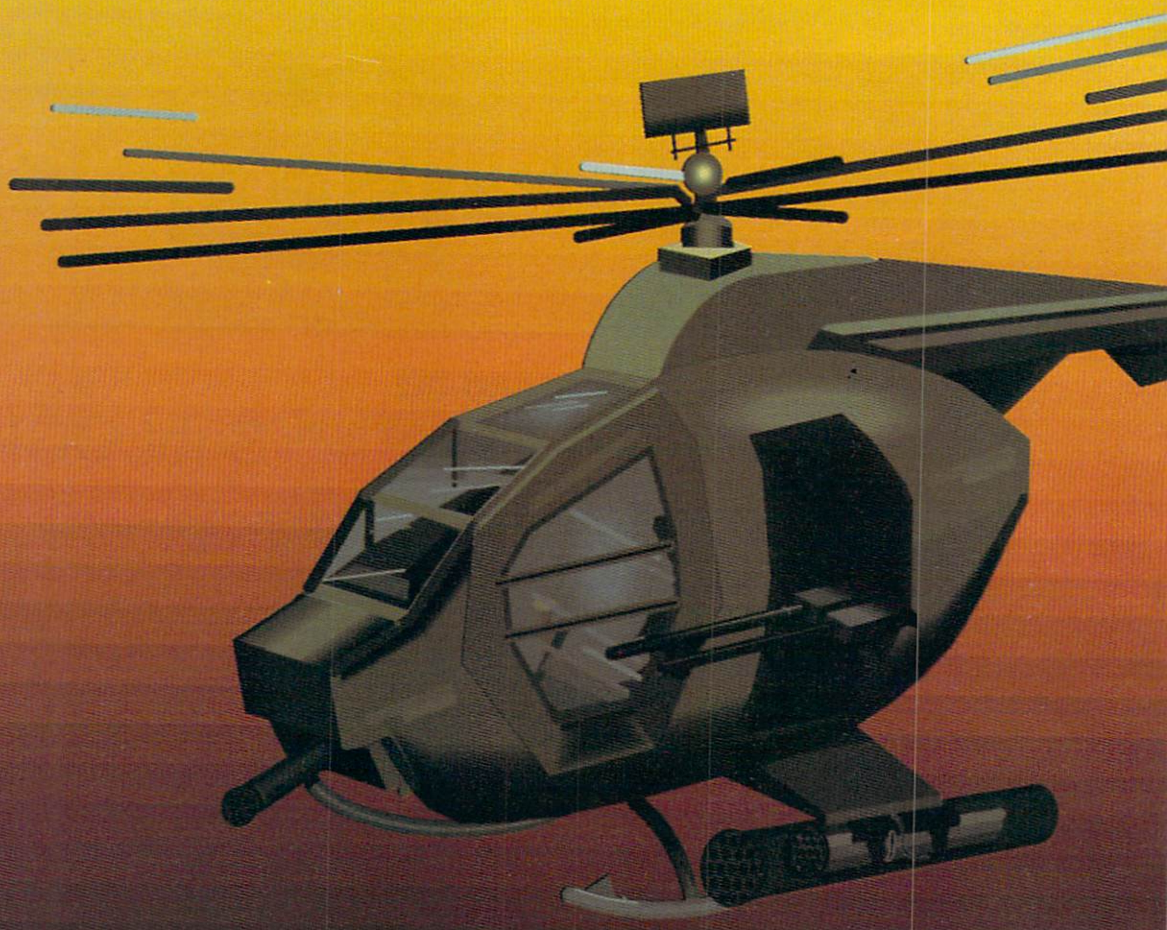


Graphics and Animation

Allied and enemy ships are depicted in truly unprecedented 3D detail, courtesy of SubLOGIC graphics and animation technology. Potential targets include enemy freighters, tankers, troop ships, destroyers, and battleships, plus various friendly forces. A complete instrument panel and split-screen views let you scan all vital information at a glance during the heat of battle.

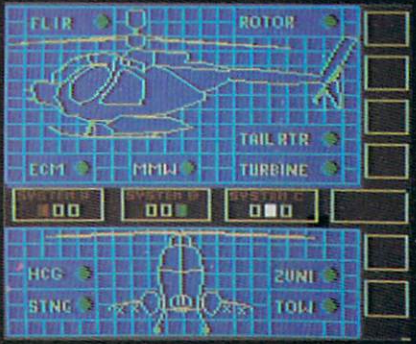
All major land masses and islands (and even a few minor ones) are properly located. Use detailed Pacific and Atlantic charts to plot your course and navigate right to the action. But be careful not to get rammed or depth-charged by enemy ships. And try to avoid the embarrassment of sinking one of your own Allied ships or running aground on an uncharted Pacific atoll.

For true submarine action and realism, nothing else compares with Up Periscope!



Strategy

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Graphics and Animation

High-speed 3D graphics, courtesy of SubLOGIC, offer superb out-the-windshield views in both day and night flight modes. A complete instrument panel and split-screen view allows you to scan all vital information at a glance while performing combat and rescue operations.

ThunderChopper carries all the standard flight instruments as well as advanced instrumentation (Forward-Looking Infra Red, CO2 laser radar, zoom television, and ECM) patterned after the equipment now being tested in the US Army's LHX 'helicopter-of-the-future' program. Armament includes TOW and Stinger missiles, a Hughes Chain Gun, and Zuni rockets – ThunderChopper's 750hp jet turbine and precise controls provide the power and maneuverability to use them all effectively.

From simple landing practice to the most complicated exploration, rescue, or combat mission, ThunderChopper is the ultimate in helicopter action and realism. No other helicopter simulation even comes close.



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BY RICHARD F. DALEY and SALLY J. DALEY

How to Build a Light Pen

Game Port Tutorial, Part 3

This is the third in a series of articles to help you understand the game ports on your Commodore 64, and to learn how to access the game ports using programs and peripherals.



Of all the peripherals commonly used with the Commodore 64, the light pen seems to be one of the most mysterious. With the other peripherals, the changes you see on the screen are due to your interaction with the computer, whereas with a light pen they are due to your interaction directly with the screen. In this article, we will build a light pen and unravel the mystery of how it works. It is not difficult.

A light pen is a device which connects to the computer at game port 1. With the appropriate program in memory, you interact with the computer by simply pointing the light pen at the screen and pressing the button on the light pen. Applications include drawing lines on the screen, selecting items displayed on the screen, and playing games.

Building a Light Pen

First obtain the parts listed in Table 1. The phototransistor used is Motorola-type MRD300. This phototransistor typically has a switching time of two microseconds. If you are unable to locate one of these in an electronics specialty store, then get a Texas Instruments TIL414 (Radio Shack part 276-145) phototransistor. This one is slower (ten microseconds is typical), but it will work. Because of the speed with which the LPX changes, the slower phototransistor will give a greater error.

When obtaining the felt tip pen, choose one that is 3/4 inch in diameter to allow enough space for housing the electronics. The writing tip should be approximately 1/4-inch wide and be removable. To make assembly easier, we also recommend that the other end be removable too. Disassemble the pen, removing the tip and felt ink reservoir from the pen. Thoroughly wash out all ink from the pen. If water does not remove the ink, try using alcohol. Save all of the pen parts, especially the pen cap, which you can use to protect the phototransistor when the pen is not in use.

Using Figure 1 as a guide, carefully drill a hole in the side of the pen body for the switch and, if the end is not removable, another hole in the end of the pen for the grommet. Now comes the tricky part. Test fit all the parts into the pen barrel. When they will all fit, remove them and, using Figure 2, a schematic of the circuit of the pen, solder the pieces together. After you have completed this, insert them back into the pen body and, using the epoxy, glue the phototransistor and switch in place. If the pen has a metal body, be sure that no wires touch the body of the pen.

Now take the 9-pin D-connector and solder the resistor R1 between pins 6 and 7. The shield is connected to pin 8, the switch to pin 1 and the phototransistor to pin 6. Next install the hood on the connector. Your light pen is now finished.

Testing the Pen

Plug the completed pen into game port 1 and type in the following program:

```
10 POKE 53280,1: POKE 53281,1
20 X=PEEK(53267)
30 Y=PEEK(53268)
40 SW= -((PEEK(56231) AND 1)=0)
50 PRINT "[CLR]";X,Y,SW
60 FOR I=1 TO 50: NEXT I
70 GOTO 10
```

Now run the program. A group of three numbers will be displayed on the top left of the screen. The first value is the X or horizontal register, the middle number is the Y or vertical register, and the last one is the state of the switch on the pen. As you move the pen about the screen, the X and Y registers will change to reflect its position. It may be necessary to adjust the brightness and/or contrast controls on the monitor to produce the desired results.

The values for the X register are in the range of 11 to 201, the Y register 42 to 255, and the switch is either 0 or 1. The range for the X and Y registers may vary by small amounts.

If your pen does not give results similar to these or if the numbers displayed do not change, check the wiring of the pen. If there is a short or if the wires are not making good contact, redo that section. The phototransistor, if improperly connected for long periods of time, may burn out.

How a Light Pen Works

To understand how a light pen works, you must first understand how the video output is displayed on your video monitor or TV screen. The Commodore 64 contains an integrated circuit chip, usually just referred to as a chip, which controls various functions of the video display. This chip, a VIC-II chip, handles almost everything associated with the video output, including the colors, characters, sprites, high-resolution graphics, screen organization and light pen.

A TV screen consists of a series of horizontal lines. These lines are written by an electron beam at the rate of 15,750 lines

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Table 1
Parts List for the Light Pen

Q1	Phototransistor (see text)
R1	Resistor 100K ohm, 1/4 watt
S1	Subminiature SPST switch (Radio Shack 275-1571)
Cable	4 ft. 2 conductor stranded 24AWG with shield
Conn.	D-subminiature 9-pin female (RS 276-1538)
Pen	3/4" diameter felt tip pen (see text)
Glue	Quick-setting epoxy

Also obtain a rubber grommet to protect the cable as it passes through the pen housing.

Table 2
Light Pen Registers

Name	Address Decimal	Address Hexadecimal	Description
LPX	53267	$D013	X Latch for light pen
LPY	53268	$D014	Y Latch for light pen
ILP	53273	$D019	Bit 3 interrupt flag
SWITCH	56321	$DC01	Bit 1 switch flag

How to Build a Light Pen

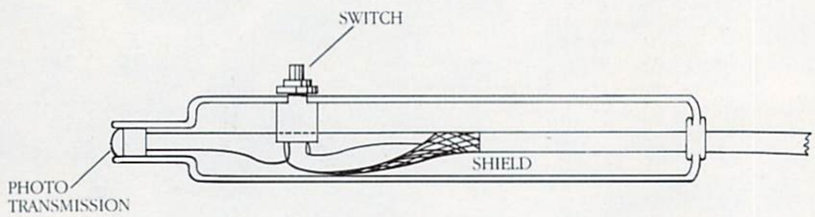


Figure 1

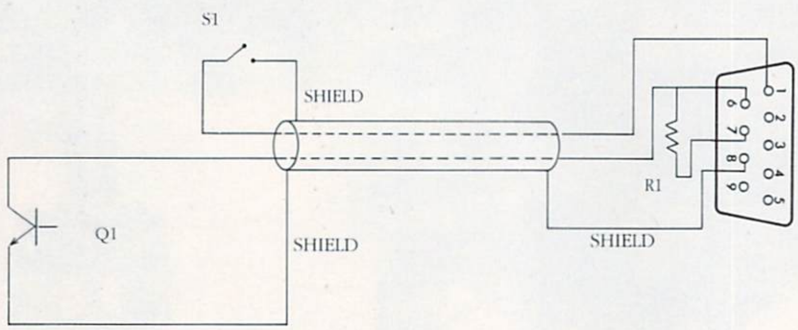


Figure 2

per second. This beam, referred to as the raster, is monitored by the VIC-II chip. The position of the beam is stored in a pair of memory locations 53267 and 53268 called LPX and LPY.

The video screen contains a number of dots of phosphor. The phosphor produces the visible display. When the raster passes a dot of phosphor on the screen, it produces a flash. This flash is so fast that it is invisible to the human eye. However, the phosphor continues to glow until the beam again passes the dot, 1/30th of a second later.

The light pen contains a light-sensitive device, most commonly called a phototransistor, that detects the presence of the beam on the screen. A properly selected device will detect the flash of the passage of the beam, while ignoring the residual glow of the phosphor. When the flash is detected, the phototransistor will send a pulse to the computer and the position of the beam will be latched in LPX and LPY.

This cycle is repeated for every frame produced by the raster beam. If the position of the beam is to be accurately located, the phototransistor must be a high-speed one, as the flash of a single dot of phosphor on the screen lasts only several microseconds (millionths of a second).

Programming the Light Pen

In this section we will look at some examples of techniques used to program a light pen in BASIC. All pertinent memory locations for your light pen are shown in Table 2. These examples illustrate the use of all these addresses, except ILP. This location, which requires the use of interrupts, is more complicated than could be readily covered in this article.

The BASIC program in Listing 1 illustrates the reading of the light pen. When you press the button on the pen, an asterisk is placed on the screen wherever the pen is pointing. In addition, the screen is cleared whenever you press the C key. To increase your understanding of using a light pen in BASIC, make some modifications to this program and observe what happens.

Othello for the Light Pen

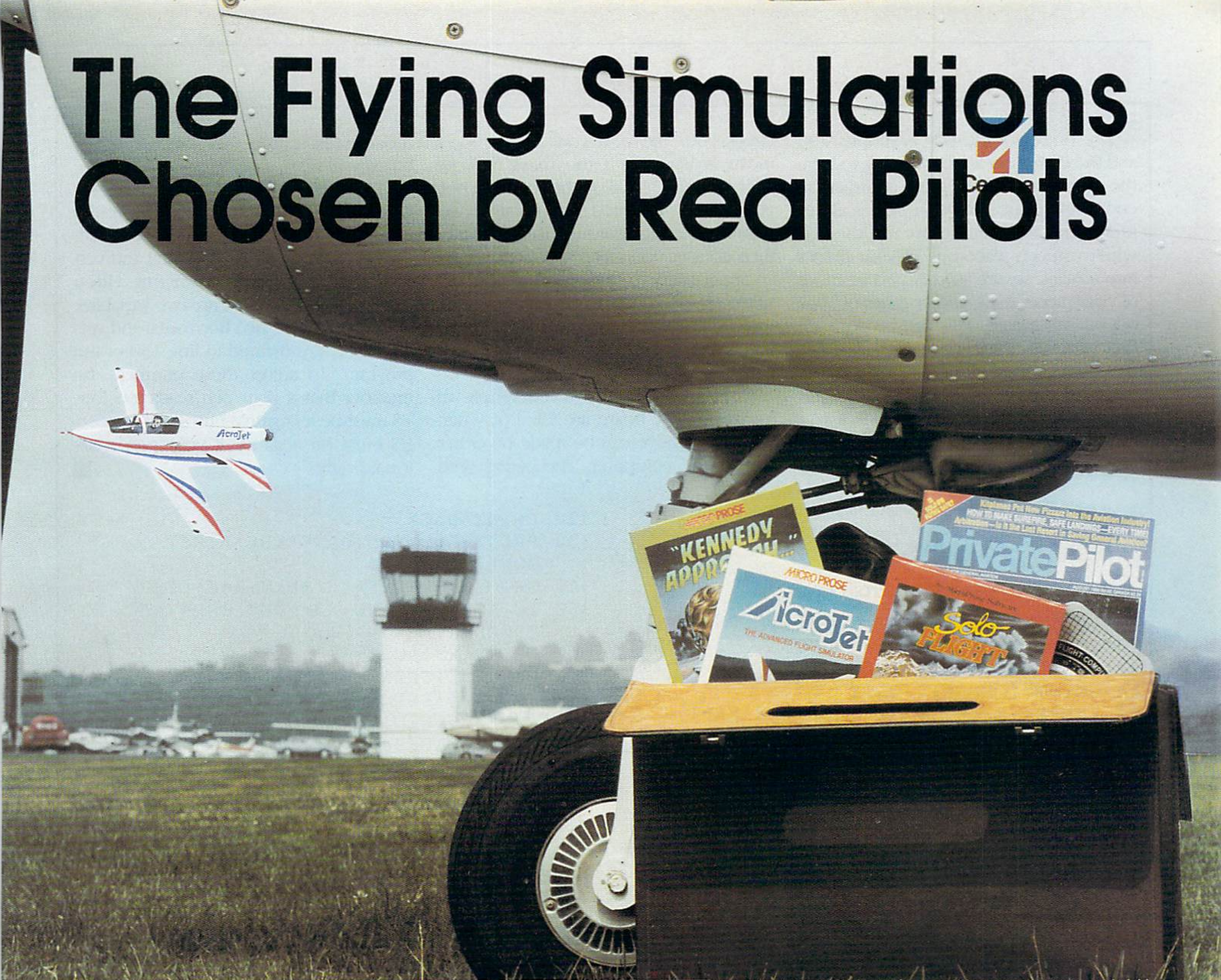
Listing 2 is a version of Othello, sometimes called Reversi, designed to be used with the light pen. The instructions for play are easy — decide upon your move, then simply touch the screen at the appropriate position with the light pen and press the button on the pen.

As mentioned earlier, the burst of light from the raster on the screen lasts only a few microseconds. With a slow pen, you will see that the values of the X position of the pen will jump around. This means that if you made the pen with the TI phototransistor, it might be necessary to take several readings and then average them. Othello contains an assembly-language program which will take the average of four readings.

After you type in Listing 2 and run the program, you are asked to select the symbols for both yours and the computer's playing pieces. Then you decide whether you or the computer will have the first turn to move. Be fair! Give the computer a turn or two being first. Use the keyboard to enter this information.

Continued on pg. 54

The Flying Simulations Chosen by Real Pilots









The toughest evaluators of flying simulations aren't computer buffs. They're actual pilots and flight professionals. And when these flyers talk authenticity and realism, one name comes up again and again: MicroProse Simulation Software. We're used to this kind of stringent comparison; our company president is a former fighter jock with 3,000 flying hours in his logbook.

Take the evaluation of Senior Editor David Martin, in *Private Pilot* magazine's August 1986 issue. Martin, a former Navy aviator who has flown almost everything with wings, reviewed five MicroProse programs, including the bestselling Solo Flight primary flight simulator. "I'd not have believed it possible . . ." he wrote, "Pilots of all sorts will be fascinated by these aviation games."

Mr. Martin isn't the only pilot who's spent many of his recent leisure hours with MicroProse simulations. Comparing his experience in training real flyers with the instrument layout found in Solo Flight, Cessna Flight Instructor Mark Rice told us "the instrument flying segments are very similar to the real thing – you're up in the clouds and using your readings to guide the aircraft."

Concorde pilot and former RAF jet flyer John Hutchinson reviewed Micro Prose' sport flight AcroJet for the British press. His conclusion: "this simulation is one that really does live up to its real-life counterpart . . . I find AcroJet completely absorbing and very exciting." High praise, from the man who flies the world's fastest airliner . . .

We regularly hear from military and commercial Air Traffic Controllers who rave about our Kennedy Approach simulation, and though we can't mention names (they're Federal employees), we can say that many of these professionals tell us Kennedy Approach is the most accurate depiction of airport conditions you can find short of a real control tower.

The MicroProse Civilian Aviation Series includes Solo Flight, which teaches the basic flying skills associated with a single-engine propeller aircraft. AcroJet recreates the sensitive control characteristics of the world's hottest sport jet – the Bede BD-5J – and includes a wide range of multiplayer competition events. Kennedy Approach allows you to guide dozens of commercial aircraft into and out of the nation's busiest airports.

From MicroProse: the flying simulators chosen not only by computer enthusiasts, but also by real pilots . . .

Solo Flight is available for Commodore 64®/128™, Apple II family, Atari XL/XE, IBM PC/PC Jr., and Tandy 1000. Kennedy Approach is available for Commodore 64/128 and Atari XL/XE. AcroJet is available for Commodore 64/128. All products have a suggested retail price of $24.95.

Available from your local retailer. If out of stock, contact MicroProse directly for further information on our full range of simulation software, and to place MasterCard/Visa orders.

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TECHNICAL TIPS/HOW TO BUILD A LIGHT PEN

Continued from pg. 52

The object of Othello is simple. You and the computer are competing to have the most pieces on the game board at the end of the game. However, this is easier said than done. A legal move in Othello is when you can place one of your pieces into a blank square so that two or more of your pieces flank one or more of your opponent's pieces. This can be done either vertically, horizontally or diagonally. You then capture all of your opponent's pieces that are between your pieces, and they are reversed to your symbol. If you cannot capture an opponent's piece, you must pass your play. The computer will check your move. If your choice for a move is legal, then the move will be shown on the board on the screen. If not, you will be prompted for another move.

After you take your turn, the computer then decides upon its move. To give you an opportunity to study its move, the position of the move is displayed on the screen. To affect the move, you must touch the screen in the box with the light pen and press the button.

A winner is determined when all squares on the board are filled or when no further move can be made by either you or the computer. The player with the greatest number of pieces on the board will win.

When you first play Othello, you may find that you have to touch the screen in a different place than is indicated. To adjust for differences in horizontal and vertical screen position from our video monitor to yours, there are two variables, HS and VS. These two horizontal and vertical offset are defined in line 130 of the program. To adjust these numbers, remember that if your pen reads too low, VS must be a negative number. Likewise, HS must be negative if your pen reads too far right.

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007, 1-800-831-2694.

Demonstration Program

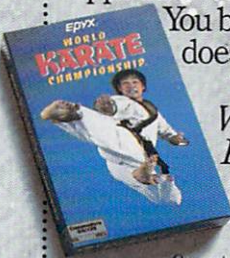
```
10 POKE 53280,Ø:POKE 53281,1'CPMB
20 CD$="[HOME,DOWN26]"'BDQB
30 CR$="[RIGHT43]"'BDXF
40 PRINT"[CLEAR]"'BATB
50 X=PEEK(53267): X%=(X-25)/4'FRPI
60 Y=PEEK(53268): Y%=(Y-5Ø)/8+1'GSKK
70 SW=-((PEEK(56321) AND 1)=Ø)'FPBJ
80 IF X%<Ø OR X%>39 THEN 5Ø'FJOJ
90 IF Y%<1 OR Y%>25 THEN 5Ø'FJMK
100 IF SW THEN PRINT LEFT$(CD$,Y%);
    LEFT$(CR$,X%);"*"'FUEC
110 GET A$: IF A$="C" THEN 4Ø'EHXA
120 GOTO 5Ø'BCMW
```

END

Othello

```
100 POKE 5328Ø,15: POKE 53281,15'CRTY
110 PRINT "[CLEAR,RED]THIS IS THE
    GAME OF OTHELLO";CHR$(142);
    CHR$(8)'DKNH
120 DIM A$(9,9),I4(8),J4(8),D(2)'BYYC
130 PRINT: HS=Ø: VS=Ø'DIVC
140 PRINT "WHAT IS YOUR TOKEN";'BBBE
150 INPUT H$'BCPA
160 PRINT "WHAT IS MY TOKEN";'BBFG
170 INPUT C$'BCKC
180 FOR K=1 TO 8'DDNF
190 READ I4(K),J4(K)'BLEG
200 NEXT K'BBEV
210 DATA Ø,1,-1,1,-1,Ø,-1,-1'BTPA
220 DATA Ø,-1,1,-1,1,Ø,1,1'BRAB
230 FOR I=Ø TO 9'DDLB
240 FOR J=Ø TO 9'DDMC
250 A$(I,J)=" "'BHUD
260 NEXT J: NEXT I'CDID
270 X$=H$: Y$=C$'CJFG
280 IF RND(1)>.5 THEN X$=C$
    : Y$=H$'GOLK
290 A$(4,4)=X$: A$(5,5)=X$'CTSK
300 A$(5,4)=Y$: A$(4,5)=Y$'CTUC
310 C1=2: H1=2: N1=4: Z=Ø'EOEE
320 PRINT'BACY
330 PRINT "DO YOU WANT THE FIRST
    MOVE? ";'BBHI
340 GET X$: IF X$="" THEN 34Ø'EICF
350 IF X$<>"Y" AND X$<>"N" THEN
    33Ø'HHXI
360 PRINT X$'BCVE
370 PRINT "[CLEAR,BLACK]";'BBXF
380 PRINT "[SPACE4]A B C D E F G H
    [SPACE6,RED]OTHELLO"'BAFM
390 PRINT TAB(24);"R.F. DALEY"'CEUK
400 PRINT "[BLACK,SPACE3,CMDR A,
    SHFT *,CMDR R,SHFT *,CMDR R,
    SHFT *,CMDR R,SHFT *,CMDR R,
    SHFT *,CMDR R,SHFT *,CMDR R,
    SHFT *,CMDR R,SHFT *,CMDR S]";
    TAB(24);"[RED]S.J. DALEY[BLACK]
    "'CFNQ
410 FOR I=1 TO 7'DDKB
420 PRINT I;"[SHFT -,SHFT SPACE,
    SHFT -,SHFT SPACE,SHFT -,
    SHFT SPACE,SHFT -,SHFT SPACE,
    SHFT -,SHFT SPACE,SHFT -,
    SHFT SPACE,SHFT -,SHFT SPACE,
    SHFT -,SHFT SPACE,SHFT -]"'BCRN
430 PRINT "[SPACE3,CMDR Q,SHFT *,
    SHFT +,SHFT *,SHFT +,SHFT *,
    SHFT +,SHFT *,SHFT +,SHFT *,
    SHFT +,SHFT *,SHFT +,SHFT *,
    SHFT +,SHFT *,CMDR W]"'BAAP
440 NEXT'BAEC
450 PRINT " 8 [SHFT -,SHFT SPACE,
    SHFT -,SHFT SPACE,SHFT -,
    SHFT SPACE,SHFT -,SHFT SPACE,
    SHFT -,SHFT SPACE,SHFT -,
    SHFT SPACE,SHFT -,SHFT SPACE,
    SHFT -,SHFT SPACE,SHFT -]"'BAGQ
460 PRINT "[SPACE3,CMDR Z,SHFT *,
    CMDR E,SHFT *,CMDR E,SHFT *,
    CMDR E,SHFT *,CMDR E,SHFT *,
    CMDR E,SHFT *,CMDR E,SHFT *,
    CMDR E,SHFT *,CMDR X]"'BAYR
470 PRINT "[HOME,DOWN4]";TAB(22);"
    [BLACK,CMDR A,SHFT C,CMDR S]"'CFYK
480 PRINT TAB(22);"[SHFT -] [SHFT -,
```

Continued on pg. 56



One or two players. Apple II & compatibles, Atari 800/130, C64/128, IBM & compatibles.

You smirk. Your opponent winces. You bow. So does he. The *World Karate Championship*™ begins. Slowly, ever so slowly, you approach. He flinches, and you make a combination front punch and kick. You spin, then do a reverse kick. A forward flip. You kick again, only higher. Bang. It connects. Lights out.



Practice long enough and your fingers will be registered as lethal weapons.

This time, you survived in one piece.

You'll have 17 intricate moves to master.

As you progress, you'll fight your way from white to black belt in 8 deadly, international settings. With a final, championship match at the base of Mt. Fuji.

See you at the Dojo.

SMASH SOMEONE'S FACE IN THE COMFORT OF YOUR OWN HOME.

It's the Sultans of Slam. The Gurus of Gashes. The meanest, nastiest rowdies to ever hit the canvas. Ladies and not-so-Gentlemen, we proudly present the vile, irreputable stars of *Championship Wrestling*.™



These animals use every trick known to man. And a few that aren't.

There are 8 of these creeps in all, each with their own disgusting personalities and revolting habits.

Throw them from the ring. Crush their heads. Slam them to the mat. Pulverize their puny bones. You'll have over 25 moves to pin your man. You'll need over 250 stitches if you don't.

And one day, after your poor battered head resembles an over-cooked cabbage, you'll be good enough to win the title. And the Championship Wrestling Belt will be yours.

EPYX®



One to eight players. Apple II & compatibles, Atari ST, C64/128.

Continued from pg. 54

```
    BACK ARROW] PASS"'CEEL
490 PRINT TAB(22);"[CMDR Z,SHFT C,
    CMDR X]"'CEBL
500 GOSUB 1670'BEPA
510 IF X$="Y" THEN 960'DFND
520 B1=-1: I3=0: J3=0'ELYG
530 GOSUB 1800'BEKD
540 PRINT "[BLUE]MY MOVE."'BAIF
550 T1$=C$: T2$=H$'CLUH
560 GOSUB 580'BDQG
570 GOTO 760'BDMH
580 FOR I=1 TO 8'DDLJ
590 FOR J=1 TO 8'DDMK
600 IF A$(I,J)<>" " THEN 730'EKVE
610 GOSUB 1420'BEIC
620 IF F1=0 THEN 730'DGLF
630 U=-1: GOSUB 1490'DHTG
640 IF S1=0 THEN 730'DGYH
650 IF I=1 OR I=8 THEN S1=S1+2'HJOL
660 IF I=2 OR I=7 THEN S1=S1-.5'HKJN
670 IF J=1 OR J=8 THEN S1=S1+2'HJQN
680 IF J=2 OR J=7 THEN S1=S1-.5'HKLP
690 IF S1<B1 THEN 730'DHRM
700 IF S1>B1 THEN 720'DHOE
710 IF RND(1)>.5 THEN 730'EIDG
720 B1=S1: I3=I: J3=J'DMNI
730 NEXT J'BBDE
740 NEXT I'BBCF
750 RETURN'BAQG
760 PRINT "[HOME,DOWN16]";TAB(22)'CENK
770 IF B1>-1 THEN 820'EGDL
780 PRINT "[RED]I PASS"'BAOL
790 IF Z=1 THEN 1380'DGIN
800 Z=1'BCKD
810 GOTO 870'BDOE
820 Z=0'BCJF
830 I=I3: J=J3: U=1: GOSUB 1490'EPXL
840 C1=C1+S1+1: H1=H1-S1: N1=N1+1'HUQP
850 PRINT "[BLUE]MY MOVE";
    LEFT$(STR$(I),2);",";
    CHR$(64+J)'FPCP
860 PRINT: PRINT TAB(22);"I TAKE";
    S1'DIPN
870 GOSUB 1800'BEKK
880 PRINT TAB(13);"[BLACK,CMDR A,
    SHFT C4,CMDR S]"'CEFR
890 PRINT "POINT TO BOX [SHFT B,
    SPACE4,SHFT B] TO CONTINUE."'BAJU
900 PRINT TAB(13);"[CMDR Z,SHFT C4,
    CMDR X]"'CECJ
910 LX%=(PEEK(53267)-75+HS)
    : LY%=(PEEK(53268)-210+VS)'IJTQ
920 IF (LX%>0 AND LX%<25) AND (LY%>0
    AND LY%<15) THEN 940'JACQ
930 GOTO 910'BDJH
940 GOSUB 1670'BEPI
950 IF H1=0 OR N1=64 THEN 1380'FLNN
960 T1$=H$: T2$=C$'CLUM
970 GOSUB 1800'BEKL
980 PRINT "[GREEN]YOUR MOVE?"
    : I$=""'CDDP
990 SW=-((PEEK(56321)AND 1)=0)'FPBS
1000 IF SW=0 THEN 990'DGUV
1010 LX%=PEEK(53267)+HS
     : LY%=PEEK(53268)+VS'GADD
1020 IF LX%-112>0 AND LX%-112<9 THEN
     IF LY%-84>0 AND LY%-84<17 THEN
     I$="P":I=0'QHYN
1030 LX%=(LX%-38)/7.5:
     LY%=(LY%-70)/15.5'GDYG
1040 IF I$="P" THEN 1070'DGFA
1050 I=LY%+1: IF I<1 OR I>8 THEN
     990'HNNF
1060 X$=CHR$(65+LX%): IF X$<"A" OR
     X$>"H" THEN PRINT "[UP2]"
     : GOTO 980'KSVL
1070 GOSUB 1800'BEKB
1080 PRINT "[GREEN]CHECKING . .
     ."'BAGE
1090 IF I<>0 THEN 1190'EGRF
1100 B1=-1'CDBV
1110 GOSUB 580'BDQV
1120 IF B1>-1 THEN PRINT "[UP]
     YOU CAN'T PASS!":FOR C=0 TO 1500
     :NEXT C:GOTO 970'KQVJ
1130 IF Z=1 THEN 1380'DGIA
1140 Z=1'BCKY
1150 GOSUB 1860'BEQA
1160 GOSUB 1800'BEKB
1170 PRINT "[HOME,DOWN11]";TAB(22);"
     [RED]YOU FORFEIT"'CFTH
1180 GOTO 520'BDGD
1190 J=ASC(X$)-64'DHNG
1200 IF J<1 OR J>8 THEN 970'FHBY
1210 IF A$(I,J)<>" " THEN 970'EKCA
1220 GOSUB 1420'BEIX
1230 IF F1=0 THEN 970'DGRB
1240 U=-1'CCBA
1250 GOSUB 1490'BEPB
1260 IF S1=0 THEN 970'DGFE
1270 Z=0'BCJD
1280 GOSUB 1860'BEQE
1290 GOSUB 1800'BEKF
1300 PRINT "[HOME,DOWN11]";
     TAB(22)'CEJX
1310 PRINT "[GREEN]YOUR MOVE";
     LEFT$(STR$(I),2);",";
     CHR$(64+J)'FPQG
1320 PRINT: PRINT TAB(22);"YOU TAKE";
     S1'DIWD
1330 U=1: GOSUB 1490'CHEB
1340 H1=H1+S1+1: C1=C1-S1
     : N1=N1+1'HUQJ
1350 GOSUB 1670'BEPC
1360 IF C1=0 OR N1>63 THEN 1380'FLGH
1370 GOTO 520'BDGE
1380 GOSUB 1800'BEKF
1390 IF C1=H1 THEN PRINT "[RED]
     TIE GAME!": GOTO 1910'FJMM
1400 IF C1<H1 THEN PRINT "[GREEN]
     YOU WON! CONGRATULATIONS!"
     : GOTO 1910'FJCJ
1410 PRINT "[BLUE]I WON!"
     : GOTO 1910'CFYB
```

```
1420 F1=0'BDNA
1430 FOR I1=-1 TO 1'EESD
1440 FOR J1=-1 TO 1'EETE
1450 IF A$(I+I1,J+J1)=T2$ THEN
     F1=1'GRPJ
1460 NEXT J1'BCCD
1470 NEXT I1'BCBE
1480 RETURN'BAQF
1490 S1=0'BDBH
1500 FOR K=1 TO 8'DDNA
1510 I6=I+I4(K): J6=J+J4(K)'ERHF
1520 S3=0'BDDB
1530 IF A$(I6,J6)<>T2$ THEN 1650'EQLG
1540 S3=S3+1: I6=I6+I4(K)
     : J6=J6+J4(K)'GAUL
1550 IF A$(I6,J6)=T1$ THEN 1580'DQJI
1560 IF A$(I6,J6)=" " THEN 1650'DNBI
1570 GOTO 1540'BEHG
1580 S1=S1+S3'CGII
1590 IF U<>1 THEN 1650'EGGK
1600 I6=I: J6=J'CHWC
1610 FOR K1=0 TO S3'DFJD
1620 A$(I6,J6)=T1$'BMJE
1630 I6=I6+I4(K): J6=J6+J4(K)'ETJJ
1640 NEXT K1'BCDD
1650 NEXT K'BBEE
1660 RETURN'BAQF
1670 PRINT "[HOME]": PRINT: PRINT'DCGI
1680 FOR I=1 TO 8'DDLJ
1690 PRINT TAB(4)'CCCJ
1700 FOR J=1 TO 8'DDMC
1710 IF A$(I,J)=H$ THEN PRINT "[GREEN]
     ";'EKHF
1720 IF A$(I,J)=C$ THEN PRINT "[BLUE]
     ";'EKDG
1730 PRINT A$(I,J);"[RIGHT]";'BJKF
1740 NEXT J'BBDE
1750 PRINT: PRINT'CBHG
1760 NEXT I'BBCG
1770 PRINT "[HOME,DOWN7]";TAB(22);"
     [BLACK]YOU [GREEN]";H$;"[BLACK]
      ";H1;"[LEFT] "'CNPO
1780 PRINT: PRINT TAB(22);"[BLACK]ME
     [SPACE2,BLUE]";C$;"[BLACK] ";C1;
     "[LEFT] "'DNTP
1790 RETURN'BAQJ
1800 PRINT "[HOME,DOWN19]"'BANC
1810 PRINT "[SPACE38]"'BANH
1820 PRINT "[SPACE38]"'BANI
1830 PRINT "[SPACE38]"'BANJ
1840 PRINT "[UP3]";'BBMH
1850 RETURN'BAQG
1860 PRINT "[HOME,DOWN11]";TAB(22);"
     [SPACE14]"'CFEL
1870 PRINT TAB(22);"[DOWN,SPACE12]
     "'CEXL
1880 PRINT TAB(22);"[DOWN2,SPACE14]
     "'CEEM
1890 PRINT TAB(22);"[DOWN,SPACE13]
     "'CEFN
1900 RETURN'BAQC
1910 POKE 198,0: PRINT CHR$(9)
     : END'EKOH
```

END

BY MATTHEW LEEDS

CP/M Public Domain Software

There's a world of software buried inside your 128, hiding under the name of CP/M Public Domain. Thousands of programs already exist: word processors, data bases, telecommunications, utilities and games—tested and documented, just waiting for you to try them out.

CP/M is a disk operating system produced by Digital Research. It has been used on hundreds of computers. Because CP/M has been used on so many computers and has been around longer than MS DOS, there is a very large library of Public Domain software available.

FOG (First Osborn Group), one of the largest CP/M user groups in the world, with over 16,000 members, has been testing their library of Public Domain software for compatibility on the 128.

According to Jack Brown of FOG, software has to be tested because each CP/M machine has different characteristics. Generally, software has to be "installed" for each machine it is going to be used on. This installation process tells the software how to control various display attributes, how to respond to certain control sequences, and other peculiarities of the individual machine. Sometimes the installation process is simply a matter of selecting items from a menu, and sometimes it involves "patching" the program using an assembly-language monitor. "Patching" is best left to someone with prior experience.

Every computer user soon finds that they spend a fair amount of time doing file-keeping. Disk collections seem to double every month or so. Keeping track of what programs are on what disk, moving programs around from disk to disk, reading files and checking for free space can be extremely tedious. There are public domain offerings that can make this task much simpler.

Super Directory, known as SD, belongs on every disk in your collection. It's a small program (only 6K), but it does a lot. The most common features you will use display a directory alphabetically, the size of each file, and the amount of free space on the disk.



There is a world of free CP/M software just waiting for you to discover it.

The program has other features as well. CP/M lets you divide a disk into user areas, like subdirectories. There is also an area common to all user areas, the SYS area. This may not seem important on a floppy drive, but it comes in very handy on a hard disk, and hard disks for CP/M systems are not overly expensive.

SD lets you look at any particular user area or all user areas. It will also check all the disk drives you have, one after the other. It will send its output to a printer or as a file to a disk drive. It will display the date and version number of a file. It can even look inside library files (a packed collection of files for telecommunication) and tell you the names of the files contained within.

Even more useful is NSWP207, also known as NewSweep. This is a powerful housekeeping tool. It's 12K in size, but worth every byte. You can copy, delete and rename individual files. You can tag a set of files for group copying or deleting, or rename groups of files using wild cards. You can check disk space, read files, or dump them to the printer. You can squeeze files for compressed storage, and unsqueeze them. You can even read squeezed files.

NewSweep will also set the file attributes (system, read only, archive). All of this can be done on any disk you place in the drive, without logging the new disk into the system. NewSweep tells you how many files are on the disk, how much space they take up, and how much space is left. Files are displayed one at a time, scrolled across the screen. A help screen is available at any time.

IMP is the most current incarnation of the MODEM7 telecommunications program used by many CP/M users. It runs at 1200 or 2400 baud and supports auto dialing, either from a number entered by hand or from a phone directory stored on disk. Phone numbers can be linked, and the program will dial from the list until it connects. A log-on message may be sent automatically.

Files can be sent and received using a CRC error-checking code, and IMP will tell you the size of a file and the amount of time it will take to send. There is a batch mode that will send a set of files and then log off. Incoming files can be sent to a printer or disk. This program is a must for logging onto CP/M electronic bulletin boards, known as RCP/M's.

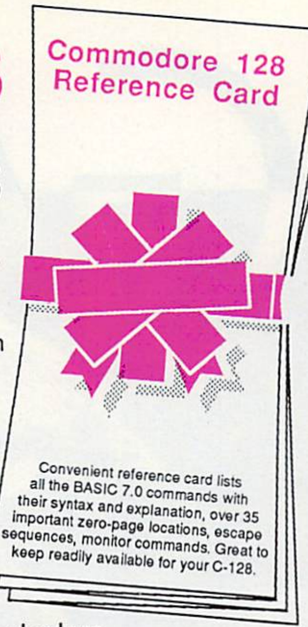
Often a program is not a single file, but a set of files. Overlays, source code, and documentation may be necessary to use the program. RCP/M's usually store programs of this type packed in library files, recognizable by their .LBR extensions. This makes it much easier to download the entire set. Once you've got a .LBR file, you need to unpack it. To do this, you need DE-LBR. It does only one thing: unpack .LBR files. That's all it needs to do. If you want to create your own .LBR files, look for NULU11 or LU310.

VDO25 is a text editor, similar to *WordStar.* It supports many of the *WordStar* commands, and has a similar feel. However, it has several advantages. It is only 7K in size and is totally memory resident. This makes it run fast. The file you are editing must also be resident in memory, which can limit you somewhat, but I haven't found it to be a problem so far. It has many of the functions you would expect in a word processor: insert and delete, block moves, search-and-replace, cursor movements and tabs, and on-screen help with user-definable levels. VDO uses a type-ahead buffer that eliminates the delays found on other systems. It is generally found in a .LBR file with documentation and installation instructions. Using the Kaypro install with highlighting works fine on the 128.

A trivia game in CP/M uses a variety of

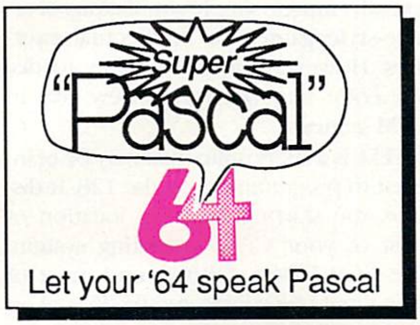
Continued on pg. 60

Begin your Holidays with a free gift* from Abacus

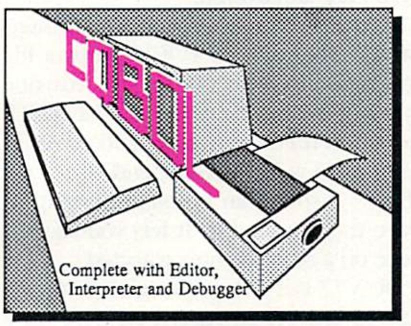


Simply fill out the attached coupon and return it to one of our participating dealers for your **free** Commodore 128™ Reference Card (Retail value $2.95). And while you're there, take a look at our complete line of top-notch software. No purchase necessary.

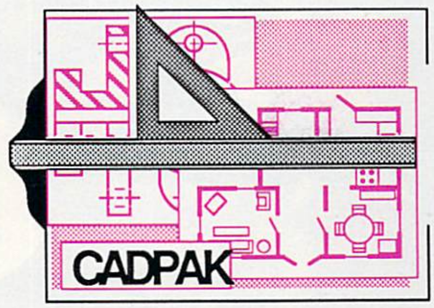
* Available at participating dealers



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Not just a compiler, but a complete system for developing applications in Pascal–with graphics. Extensive editor with search, replace, renumber, etc. Standard J & W compiler that generates machine code. High-speed disk access. 48K RAM is available. If you want to learn Pascal or to develop software using the best tools available–**Super Pascal** is your first choice. **C-64 $59.95**



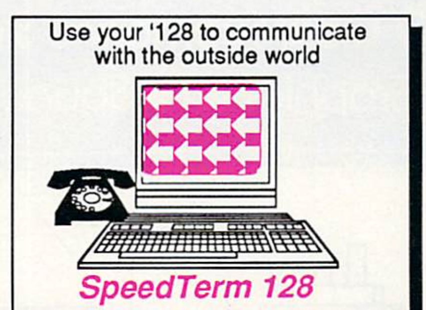
COBOL
Now you can learn COBOL, the most widely used commercial programming language, on your 128 or 64. COBOL Compiler package comes complete with syntax-checking editor, interpreter and symbolic debugging aids. New '128 version works with 40/80 column monitors and is quicker than the '64 version. **C-128 $59.95** **C-64 $39.95**



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Easy-to-use interactive drawing package for accurate graphic designs. Dimensioning features to create exact scaled output to all major dot-matrix printers. Input via keyboard or lightpen. Two graphic screens for COPYing from one to the other. DRAW, BOX, ARC, ELLIPSE, etc. available. Define your own library of symbols/objects–store up to 104 separate objects. **C-128 $59.95** **C-64 $39.95**

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Learn the the language of the 80's and beyond
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Super C Compiler
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TECHNICAL TIPS

Continued from pg. 58

formats for the questions, and you can create new question files with your own stumpers. Games on CP/M systems are not usually graphically oriented, since graphics must be created using ASCII characters. Generally, games are either text adventures, simple simulations of arcade-style games, or intellectual exercises. However, the 128's ability to display color may open up a new area in CP/M games.

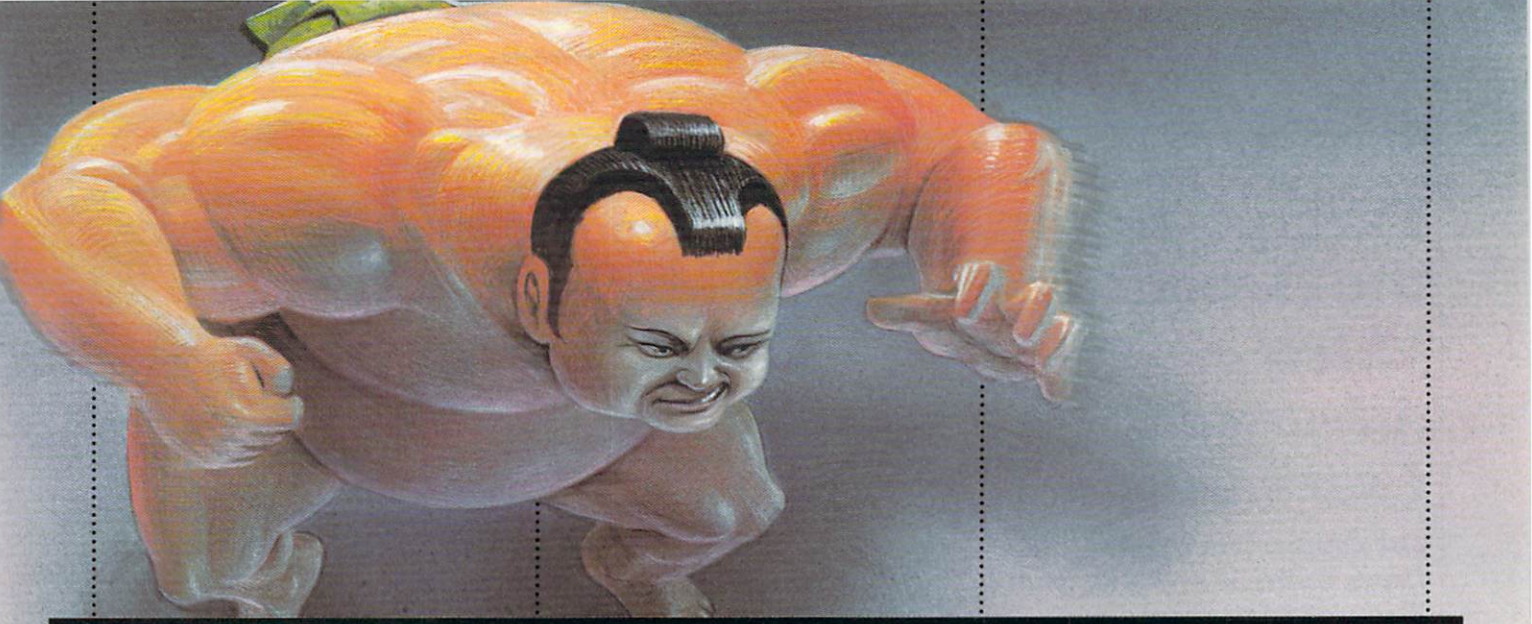
TELL is a short utility that may be of interest to programmers on the 128. It displays the starting memory location of most of your CP/M operating system. The CCP, BDOS, CBIOS, and most of what would be considered the Kernal on the 64 are all covered.

I found a tremendous number of interesting small utilities. LOCK keeps a file protected from access or use. Anyone trying to use the file gets a LOCKED FILE message. FILTER converts standard ASCII files for use with *WordStar;* and vice versa. ALLOC displays an editable bit-map of space usage on a disk. It lets you allocate space on a disk as write-protected.

DU-V77 is a disk editor giving you access to any track, sector, or byte on a disk. MENU displays a menu of executable files and runs the one you select. CV displays and compares two files. UNSPOL prints an ASCII file as a background task. HP is a calculator with RPN logic. It prints in any of four modes: hex, decimal, binary or ASCII. PRINT is a text-output formatting utility that adds titles and page numbers to text files. And there are hundreds of others as well.

A few words of advice: First, if you haven't already, open your *128 System Guide* to page 220 and remove the coupon for the additional CP/M utilities from Digital Research. They are well worth the money. Second, pick up a third-party guide to CP/M at the bookstore. Well recommended is Osborne/McGraw-Hill's *CP/M User Guide,* Third Edition. Third, join a user's group. If you can't find one in your area, contact FOG at P.O. Box 3474, Daly City, CA 94015. Their phone is 415-755-2000.

It's very important to realize that you don't have to reinvent the wheel every time you run into a problem. Most likely, others have had the same difficulties, and are more than willing to help. Give them a chance to get you up to speed, and then pass the help on to others. That's what Public Domain software is all about.



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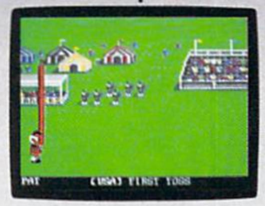
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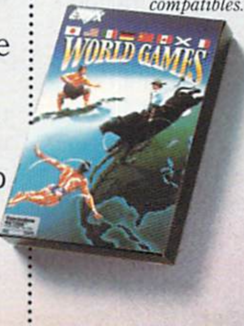
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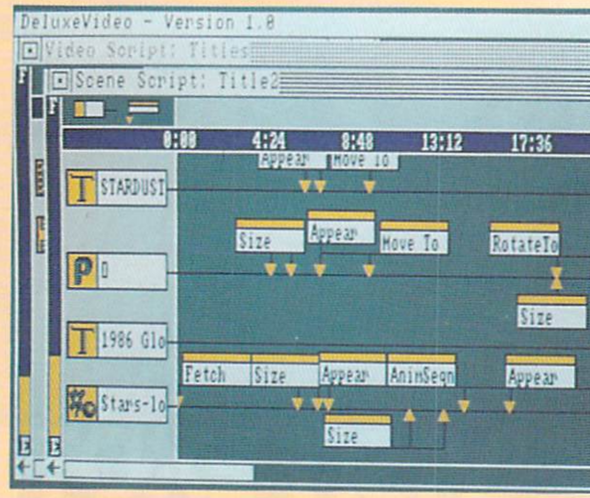


EPYX®

BY MATTHEW LEEDS AND MIKE LUBUGUIN

Excerpts from the *Deluxe Video Advanced User's Guide*

***The Deluxe Video Advanced User's Guide* is available from Electronic Arts at no charge to all registered owners of *Deluxe Video*.**



Using Deluxe Video, create your own commercials or create them for others.



Chapter 5 - Advanced Titles

5.1 Introduction

Once you've mastered some of the advanced features of *Deluxe Video,* you can use them to create new effects and designs in text displays. Although this chapter is called Advanced Titles, most of the techniques discussed here can be used in any video that requires text.

5.2 Special Polygon Text

Although objects cannot be rotated, the special set of characters in the Polygon Text can be rotated. These can be used to add spice to title text. Strobe can also be used to create unique effects. Using the Strobe effect with a Move To effect, and leaving it on a little longer than the Move To, will leave a trail on the screen and make the foreground letters flash. Also, strobing in a new text line will cause lines already in the scene to flash. By adjusting the timing between the Strobe and Move To effects, you can create trails that are a series of duplicates of the text or a solid smear. Experiment with different combinations of the attributes of text lines: Jam 1 and 2, Comp, and Inv. Each of these will create a different trail.

5.3 Twinkles

You can create a twinkle or star reflection effect on text using the Framer. Start by using *Deluxe Paint,* and use the text mode to produce your title. Then make an animation sequence with the text by first copying an additional cel of the text, then adding the twinkle to certain areas of the text. Start with a small star-shaped (four-, six- or eight-pointed) twinkle in a specific location, copy the cel and add a larger twinkle in the same location. Then copy the cel and add a larger twinkle and so forth until each successive cel shows a larger twinkle than the last.

You can add several stars at various points on the letters, but we recommend that you place them at edges that would naturally catch light from a single point (Illustration 5.2). Save the drawing, then load it into the Framer and make an animated object of it. We've tried making an animation of just the twinkle without the text and overlaying it, but there are problems with alignment using that method.

5.4 Glows

Glow effects are also possible using *Deluxe Paint.* Use *Deluxe Paint* to create a line of text. Then outline the letters with a one-pixel border surrounding each letter. Do two or three of these borders, each in a different color. The text must be large enough so that adding the borders will not distort the text making it unreadable. Save the text as a brush in the object drawer. When the text is used in a scene, use the Cycle Color option and set the three border colors of the text as the colors in the cycle range.

Deluxe Video can use any new fonts that become available for the Amiga. When you install new fonts on your Maker disk, and use them in your videos, be sure to install the new fonts you use on your Player disk as well.

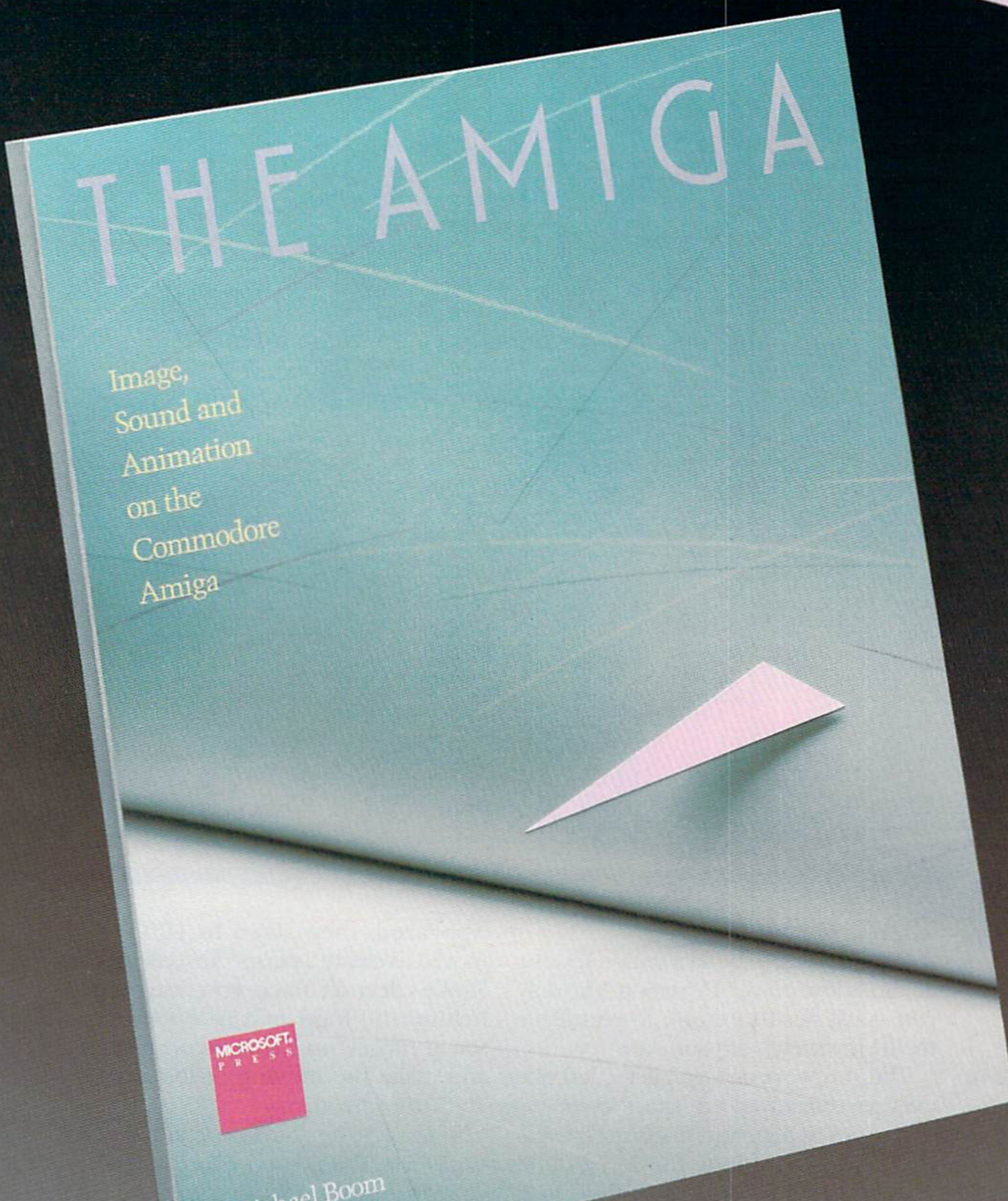
Chapter 10 - Commercials

10.1 Introduction

Until recently, the only access advertisers had to television audiences was on network television. Ad rates were out of reach of most small businesses, both in

Continued on pg. 64

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Continued from pg. 62

the production cost of the ads and the air-time cost. There have been some changes recently, and *Deluxe Video* is a significant portion of that change. Low-power TV stations, cable networks, satellite networks, corporate networks, and narrow-casting, have all opened up new venues for smaller scale, targeted advertising by small businesses and regional suppliers.

10.2 Potential Markets

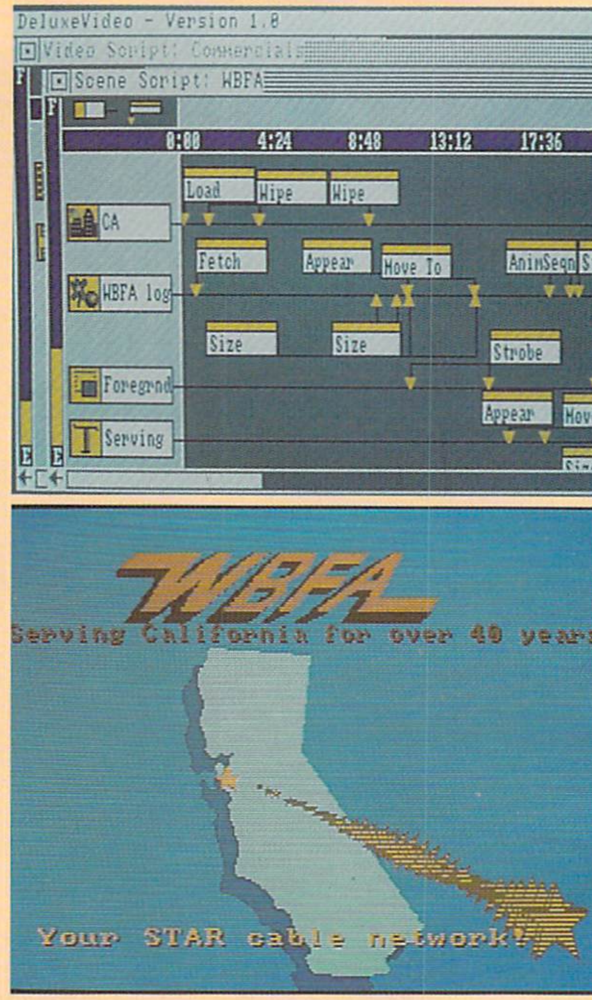
Low-power TV stations are licensed by the FCC, broadcast within a limited range, are not required to carry any particular programming and are not covered by most of the regulations that apply to full-power stations. There are over 150 low-power stations currently on the air, and construction permits for another 850 have been issued.

Cable networks have grown despite predictions to the contrary. Most offer public access programming and need to sell advertising space to local businesses to cover their cost of operations. Not all cable companies are large. Satellite Master Antenna TV cable networks (SMATV) service condominiums, apartment complexes and housing developments. They usually have open channels that are not being used, and are perfect vehicles for local advertising.

A new development is corporate network TV. A part of the video conferencing phenomenon has corporations beginning to use their installed base of video distribution for other purposes. Tapping into this network may soon be a growing business.

10.3 Commercial Design

To produce your own commercials or create them for others requires a good background in advertising. One place to start is watching TV. Forget about the programs themselves, for now they will be good times to take a break and get a snack out of the fridge; it's the commercials you want to watch. Notice how they are structured, how often they repeat the product name, how they tie the use of the product to a lifestyle or look. Notice camera angles, lighting, cuts and wipes, and pay attention to the dialogue or voiceover. You won't be able to duplicate the exact look and feel of commercials that cost over $100,000 to produce, but TV is the cheapest school you can attend for ad design.



10.4 Tutorial

We are going to build a station ID for a fictitious low-power TV station. The only part you'll need to create to reproduce the ID is a sketch of your state.

The script we are going to describe uses several advanced effect combinations. Look at the script diagram (Illustration 10.2) and notice the foreground track. It is used to control the WBFA logo track (#2) and the polygon track (#5) containing the tumbling star.

Let's go through the video one track at a time.

Track #1 loads and wipes on the background screen of California. You can select any wipe, or jumpcut it onto the screen. Track #2 fetches the station logo. This can be any object you create in *Deluxe Paint,* or you could substitute a text track. You could use an animated object for more interesting effects as well. The logo is sized to 0% in both dimensions, Appeared, then sized to 100% and moved to create a perspective effect. The Strobe effect on Track #3 creates a trail behind the logo as it is moved. The Stamp effect is used to conserve memory and make the moving of the text on Track #4 smoother.

Track #3's first Strobe effect has been explained. The DisApp effect is used to erase the logo and the first text line. The second Strobe effect controls the Polygon Track #5. Track #4 is a text track with only an Appear and Move To effect. Track #5 uses one of the special characters in the polygon text set. The character is a star. It is Sized to 0%, Appeared, then Moved, Rotated 360%, and Sized to 100% simultaneously. The second Strobe effect on Track #3 creates a trail behind the star as it moves. The end of the Strobe effect erases the trail (Illustration 10.5). Track #6 is a text track with only an Appear and Move To effect.

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Inside GEOS

With Brian Dougherty, President of Berkeley Softworks

BY MATTHEW LEEDS

There is a new computer waiting for you inside your 64 or 128. And all you need to discover it is the GEOS *operating system from Berkeley Softworks. It adds icons, pull-down menus, a mouse and mouse cursor, which opens your computer to a new style of computing.* GEOS *is bundled on disk with the new 64C, along with a word processor,* geoWrite, *and a paint program,* geoPaint. GEOS *can also be purchased separately.*

Here Brian Dougherty, President of Berkeley Softworks, discusses the newest versions of GEOS, *new applications in the works, and plans for the future.*

Leeds: What is the biggest change since you first shipped Version 1.0 of *GEOS*?

Dougherty: The biggest change is in the manual. It has been tremendously improved, much of it because of our customer support people. In the writing of the first manual, we may have assumed that everyone had used some kind of icon-driven interface in the past. We no longer make that assumption.

Leeds: How are you handling upgrades for those users who purchased V1.0?

Dougherty: Everyone who purchased V1.0 and returned their warranty card has been upgraded to V1.2 at no charge. When we introduce V2.0 sometime in 1987, we will upgrade existing owners at a small fee. This will apply to any *GEOS* user, whether they purchased their copy from Berkeley Softworks or it came bundled with a 64C. However, they must have sent in their warranty cards.

We will always provide an upgrade path on all new versions of *GEOS*. Any data created under V1.0 can be used with V1.2. It is important to note that we are only supporting application compatibility for V1.2 and later. All registered owners of V1.0 have been upgraded. No one should still be using V1.0.

Leeds: You're handling customer support for *GEOS*, including those copies sold with the 64C. Will the increased number of users cause a problem for your customer support people?

Dougherty: Right now our customer support lines are not busy full-time. We think that's partly due to the fact that V1.0 needed more support than V1.2 needs now. The problems with printer drivers created the bulk of our calls. The manual that ships with V1.2 is also vastly improved, partly due to questions that came into customer support. If we should find that we need to add additional customer support personnel, we will, but we've tried to make the manual our primary means of customer support.

Leeds: What kind of support do you offer owners of third-party disk drives?

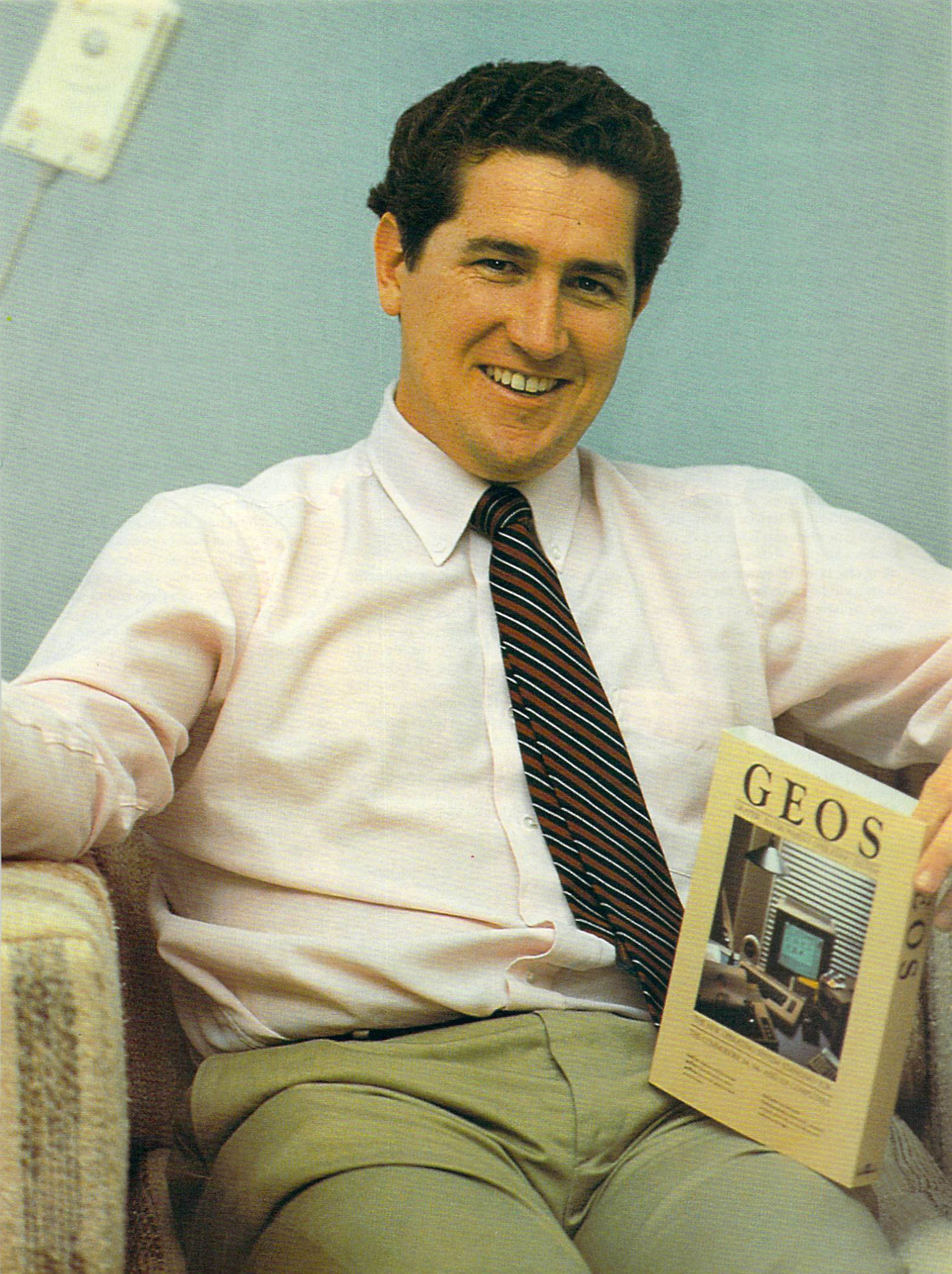
Dougherty: There may be some other drives that work with *GEOS*, but we have not gone out and tested to see ourselves which do and which do not. The only way we currently know is if a user calls us and tells us. So far, the only drive we've heard about that works is the Indus GT. We will be building the capability by installing additional disk drivers into *GEOS*, with the anticipation of supporting Commodore's 1581 3-1/2-inch drive when it is released. We should be able to support other disk drives if there is sufficient demand.

Leeds: You describe *GEOS* as an operating system. What's the difference between an operating system and an integrated package?

Dougherty: Most current 64 owners think of BASIC as their operating system. Your turn the machine on and you're in BASIC. But that's not really an operating system. When we set out to create *GEOS*, we set out to build a true operating system. What the application programs were going to be weren't defined at that point.

Integrated packages can share information only on a limited basis, and only among the applications included in the package. An operating system creates a framework for other developers to design applications that share data. This will be shown more as we come out with the spreadsheet and database applications that share resources and data using the *GEOS* operating system.

When we do a new printer driver or a new input driver, you will be able to use it with all the applications running under *GEOS*. That wouldn't be possible with an integrated package.


GEOS

Inside GEOS

Leeds: How would you compare *GEOS* to other similar operating systems, for instance, *Windows* in MS-DOS?

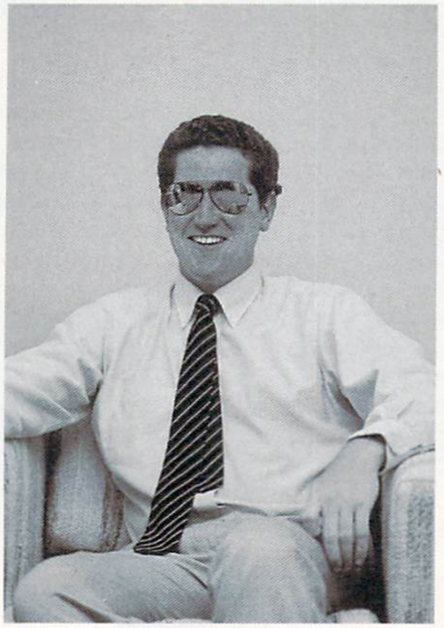
Dougherty: *Windows* is built on top of MS-DOS. In fact, you can even take MS-DOS and break it into the actual primitives that handle things like the disk drive, printers and keyboard input. The user interface handles the user's input: parsing it and passing commands to the primitives. *Windows* is basically a user interface that uses those same primitives.

Since there was no equivalent to MS-DOS on the 64, we created a new Kernal of *GEOS* primitives. In fact, the *Desktop* program is similar to the *Windows* application that sits on top of MS-DOS.

At one point, we were going to create two user interfaces, the *Desktop* and a command-line interface where the user could type commands in. In fact, there is nothing keeping someone else from creating one now. There are advantages to a command-line interface. For instance, it's hard to have wildcards in a graphical interface.

Leeds: This is the first operating system that's ever been copy-protected. Why copy-protect *GEOS*?

Dougherty: The copy protection is intended to create a justification with developers for not protecting the applications. Since you must install applications before you can use them, and installing them will then let you use them only with the copy of the operating system



they were installed with, it eliminates the need for protecting applications and lets the user make needed back-ups. Until the public changes their perceptions on software piracy, we believe the need to copy-protect will continue to exist. Too many people view software piracy like littering: somebody else will pick up after me, it's only one piece of paper, only one copy of the program. We've tried to design a system that is transparent to the user. It lets them make back-ups of their applications and of their *GEOS* operating system. It shouldn't be an inconvenience to an honest user.

Leeds: You've said that the 6502 microprocessor is uniquely suited to personal computing, and in particular, this application. Why?

Dougherty: The 6502 microprocessor is RISC (Reduced Instruction Set Command) ahead of its time. It doesn't try to implement a lot of fancy instructions. Its design is very clean, and it executes its instructions in very few clock cycles. The average number of cycles to complete an instruction is three to eight times fewer than the 8088 or 68000. Remember, though, that it actually runs slower than those chips, but the net result is it can sometimes complete tasks faster.

It turns out that something like 80% of all computing is just moving bytes around. No fancy stuff like calculating sines, just moving bytes. Word processing is a perfect example. The complex processor that takes lots of cycles to do any instruction is wasting cycles in these instances. The 6502 is very efficient when it comes to this.

RISC architecture also has lots of registers since register-based operations happen faster. Well, zero page is treated that way in the 6502. In our coding, we take a large chunk of that zero page and create pseudo-registers out of them. We name those memory locations, and create a 256-byte register set out of zero page.

One last thing that's very efficient about the 6502 is the way graphics are handled. During phase one of the clock cycle, the processor is never accessing anything, so the graphics chip accesses during this phase. For most of the time, the processor and the graphics chip are accessing the same memory transparently. If you could give us a 4 MHz 6502, we could run rings around an 8 MHz 68000.

Leeds: You are now shipping V1.2, the version included with the 64C. What's new in 1.2?

Dougherty: There were certain printers that we had problems with in the earlier versions. Some would lock up after a printout. When you look at all the combinations of printers and interfaces, you can see how it's impossible to test them all. We've now included about 30 printer drivers, covering just about every printer anyone has called us about. We've also improved the printer drivers so the printout is faster.

There were five printer drivers that supported about 20 printers on the first version of *GEOS*, and now there are 11 drivers supporting about 30 printers. New printer drivers support the JX-80, Okimate 10, MX-80, and Blue Chip printers. There is also an ImageWriter II driver.

Continued on pg. 123

Command-line interface: This is the way in which you enter commands into a non-graphical operating system. The commands you enter into a 64 or 128 using either BASIC or the DOS wedge can be thought of as using a command-line interface.

Drivers: Drivers are small sub-programs that handle input and output for the main program. The advantage of drivers is that the main program can be smaller since it does not need to contain code to handle every combination of devices that might be connected to it. You can just tell the program what device driver to use and it will install the code for that device into the main program. Drivers can be used to support printers, disk drives, input devices, monitors, modems and other peripherals.

Parsing: When you use a command-line interface the operating system breaks the line you've typed in down into the component commands that make it up. This process is parsing. Parsing is also used in game programs that accept text input.

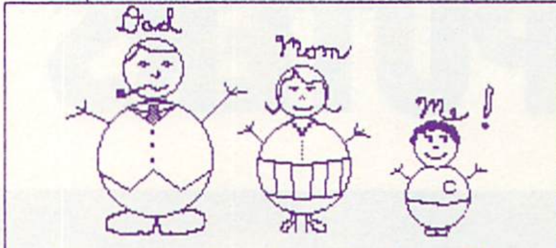
Primitives: These are the nuts and bolts of an operating system. Each primitive is a single command or event, such as printing a character to the screen, getting a character from the keyboard as you type, or opening a file.

It's hard to believe another year has gone by !! Johnny turned 5 this year and started kindergarten. We are hoping none of the kids at school have spoiled Christmas by telling him there is no Santa Claus. So far we don't think he knows, because he keeps falling for the elves around the house spying for Santa Claus trick. Big John teases the poor child unmercifully, "Santa's gonna bring you a stocking full of coal." Sometimes I wonder who is the bigger baby.

John got a big promotion at work in September and his head was so big he couldn't fit through the door till Halloween (only kidding, actually I'm very proud of him). He's the youngest director the firm has ever had.

New hobby department !! John bought new software package called GEOS for the C-64. Since he got it in the mail a few weeks ago, I don't think I've had his attention for more than three minutes. I can hardly complain though, because I use it whenever he isn't. In fact this letter was written using geoPaint, one of the programs that comes in the GEOS package.

Budding artist department. Even Johnny has gotten into using the computer. The picture shown in the box above was his contribution to our Christmas letter. I told him I wasn't flattered by the figure he gave me. He said I shouldn't get upset because they're snow people. Unfortunatly I have put a few pounds on. We just joined a health club so I'm hoping to lose the weight before summer



Johnny's first art masterpiece. The Coyle family snowmen.

Caroling department. For those of you who are in the neighborhood, we are going caroling again this year on the Saturday before Xmas. If you are interested, meet in the church lot at 8:00 P.M.

I know many of you will find this hard to believe, but John made a delicious fruit cake. I don't even like fruit cake and I liked the one he made. He got the recipe over the phone line using the computer. On the back of the GEOS disk there's a telecom program for an on line service called QuantumLink (don't I sound knowledgeable). Anyway, John got this recipe from the on-line USA Today. Don't worry, we won't send you a fruit cake, but I did include the recipe below.

Well I wish everyone the best, try to stop in over the holidays.

Edible Fruit Cake

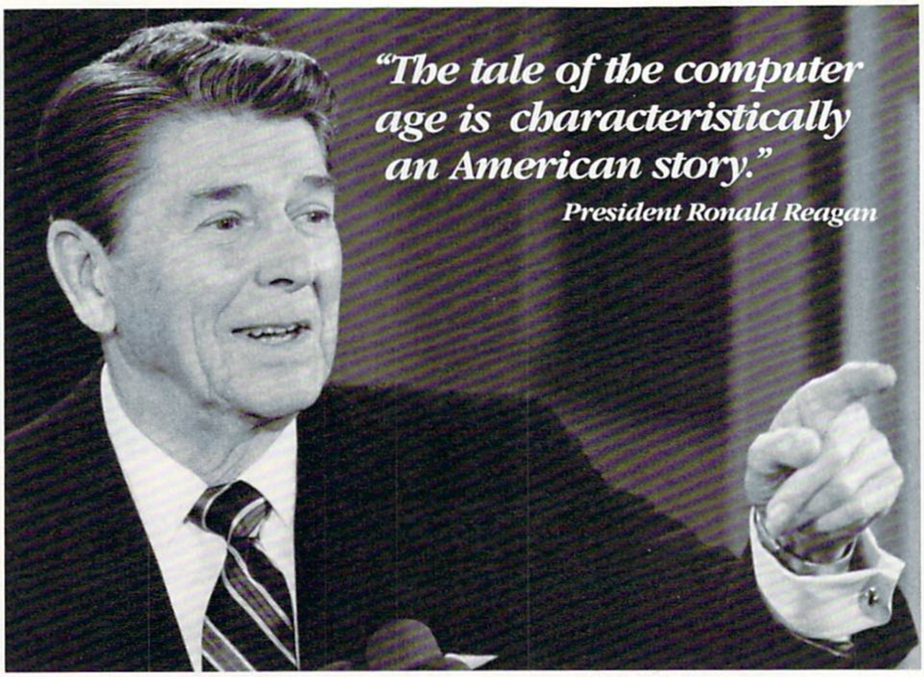
4	cups flour	1 lb	pecans
1	tbls each: cinnamon, allspice, and nutmeg	1 lb	brown sugar
		1 lb	butter
1/2	tsp mace	15	egg yolks
1 1/2	tsp salt	15	egg whites, beaten stiff
2 1/2	lbs raisins	1/4cup	each: burbon and wine

Sift together flour, spices, and salt. Cream together butter and sugar; beat in egg yolks. Mix all ingredients. Bake for 3 to 4 hours at 275. Cool and store.

Merry Christmas and a Happy New Year

- Love, The Coyle Family

1986-THE YEAR IN COMPUTERS



UPI/BETTMANN NEWSPHOTOS

"The tale of the computer age is characteristically an American story."

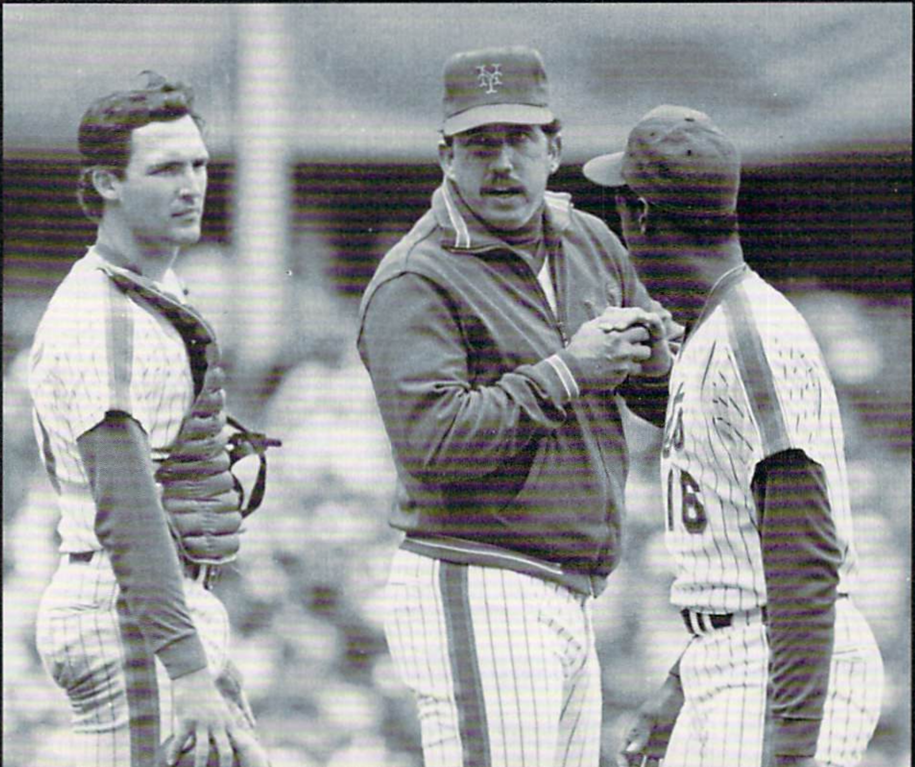
President Ronald Reagan

"You can't do anything with cars anymore. You open the hood and it's all computers."

Comedian Jay Leno in Playboy

"I use the computer a little."

New York Mets manager Davey Johnson



UPI/BETTMANN NEWSPHOTOS

"Late yesterday, for example, after six weeks of nearly round-the-clock despair, I achieved interface with my daisy-wheel printer."

Russell Baker, in The New York Times

"His body was on the floor by his computer and the telephone was ripped out of the wall."

Mrs. Frances Chow, about her 15-year-old son David, who was killed in a dispute with a friend over $85 worth of computer equipment.

"I asked for a car. I got a computer."

***Matthew Broderick in* Ferris Bueller's Day Off**

BY DAN GUTMAN

George Jetson and family returned to Saturday morning cartoons in 1986, but it just wasn't the same. Technology has advanced so quickly since they first appeared on TV that the world of *The Jetsons* no longer amazes us. We have computers. We have VCRs. We have compact disc players. We have robots. What high-tech toy does Elroy Jetson have in "the future" that we don't already have today?

1986 was the year of The Goodwill Games and *Rambo.* (Not the movie, the computer game.) It was the year we crossed "the line of death." America celebrated itself this year, in the sorrow of the Challenger explosion and the joy of Ms. Liberty's birthday.

The personal computing world rushed headlong into its second decade. As always, there were the spectacular successes and frustrating failures. Mom and Pop companies made the Fortune 500 and major corporations were swallowed up in that black hole known as Chapter 11. It's tough to summarize that tornado in a few magazine pages, but like America, every year we give it our best shot...

NEW COMMODORE HARDWARE

If 1985 was the year the Amiga was born, 1986 was the year the Commodore 64 was born again. Unlike Coca-Cola™, Commodore kept the classic alive without the necessity of public outcry. They changed the look of the beloved C64 but, in combination with the Commodore 128, kept the tradition.

The fully compatible Commodore 128 sold over 500,000 units in its first year, making it one of the fastest selling computers in history. By giving away a free modem and telecommunications software with each 128 sold in the first few months of its introduction, Commodore made it possible for thousands of new computerists to discover the joy of going on-line.

In June, we saw the birth of the Commodore 64C, a machine that's a lot prettier to look at than the old 64, with a pile of bundled software to boot. No longer is a computer a box you bring home, plug in, turn on, and watch it do absolutely nothing. When you bring home a 64C, you can do word processing, graphics, telecommunications, and even learn about biology.

The Amiga did not stand still in 1986. The first wave of software appeared, and some of it (particularly Electronic Arts' *Deluxe Video* and Mindscape's *CinemaWare)* knocked our



The Goodwill Games

UPI/BETTMANN NEWSPHOTOS



The Challenger Explosion

UPI/BETTMANN NEWSPHOTOS



Ms. Liberty's Birthday

UPI/BETTMANN NEWSPHOTOS

socks off. When the price of the Amiga was reduced $500 in May, thousands of us ran out and bought our first really high-powered computer.

As usual, there were new and different gizmos you could plug into Commodore's computers. Bodylog's Bodylink is an all-purpose exercise machine/biofeedback device that helps get our bodies and minds in sync. Cauzin's Softstrip makes it possible to print software on plain old paper and transfer it directly into our computers.

Sharedata's Z-Glove is probably the most offbeat peripheral ever. It's a cotton glove embedded with sensors that plugs into the computer. When you move your hand, you can manipulate objects on the screen. Now we can simply wave our hands in the air to conduct a symphony orchestra or play computerized air guitar. The practical applications may be elusive, but you can't say the computer industry isn't imaginative.

SOFTWARE: FROM VIETNAM TO FRED FLINTSTONE

On the software front, 1986 was a big year. Probably the most significant program for Commodore users was *GEOS* (Berkeley Softworks), which came packed with every new Commodore 64C. *GEOS* puts a "desktop environment" on-screen so you can open and close files with icons and windows. Until now, this capability was available only on more expensive computers.

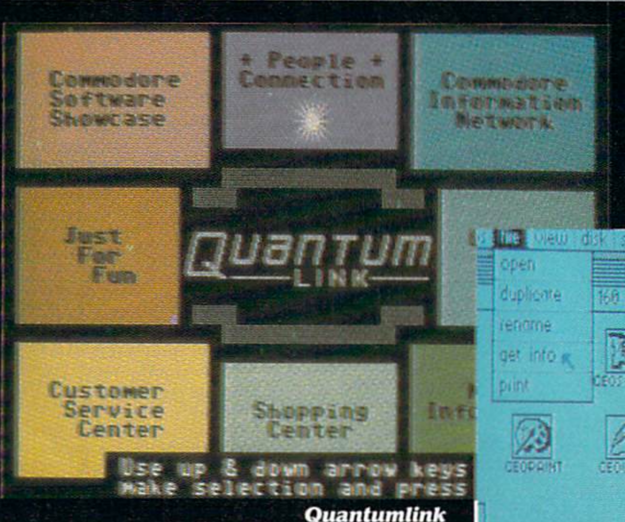
The other major program (also packed with the 64C) was software for accessing QuantumLink, a Commodore-specific electronic information network. This network has a base cost of just $10 a month and features games, software previews, electronic chat or mail, conferences, and other goodies. As we go to press, about 20,000 subscribers have signed on. In addition, Commodore and Quantum teamed up with the folks at Lucasfilm to create *Habitat*, an on-line role-playing game that lets people all over the country play simultaneously.

This was the year entertainment staged a comeback, as several companies announced new dedicated game machines. For the 64, Epyx's phenomenal *Summer Games* of a few years ago begat the equally successful *Winter Games*, which in turn gave birth to this year's *World Games*.

Epyx also gave us an "enhanced version" of last year's *The World's Greatest Baseball Game*, making us a tiny bit suspicious of their titles. Also on the baseball diamond, Accolade gave us *Hardball*, which is the most spectacular pitcher/batter simulation we've seen. Accolade was formed last year by for-


Commodore 64C


Commodore 128



Quantumlink


Habitat



Geos

mer Activision superstars Alan Miller and Bob Whitehead, and seems to be getting off on the right track.

In other sports software, *One-On-One* (Electronic Arts) was followed by *Two-on-Two* (Activision). If you're smart, you'll register the title "Three-On-Three" fast.

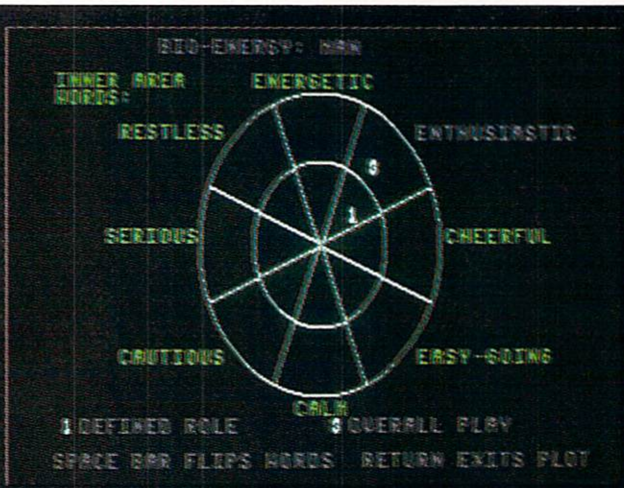
Like an old soldier, war games never die. MicroProse followed up their successful submarine simulation *Silent Service* with an equally compelling *Conflict in Vietnam*. The geniuses at Infocom released their first title that recreates actual locations and events. In their *Trinity,* you travel back in time to July 16, 1945, to try to prevent the world's first atomic explosion.

Pac-Man is long dead and buried. This year, we saw far more intriguing games. Electronic Arts gave us a weird exploration into our own brains with Timothy Leary's *Mind Mirror.* They also released *Murder Party,* which allows you to invite your friends over and have a simulated killing, if you're into that sort of thing. *Deceptor* was a new title from Accolade based on the popular Transformers™. Broderbund's *Where in the World Is Carmen Sandiego?* included a copy of *The World Almanac & Book of Facts* right in the package.

Like every year, there has to be an oddball game. This year I nominate *Yabba Dabba Doo,* made by a British software company. In the game, you control Fred Flintstone and you have to collect rocks in order to build a house in Bedrock. Watch out for Bam Bam.

This was also the year computers finally got sexy. *Intra-Course,* (IntroCorp) made it possible to explore your own sexuality, and it was even endorsed by Dr. Joyce Brothers. Her competition, Dr. Ruth Westheimer, found the time in her busy schedule to turn *Dr. Ruth's Game of Good Sex* into a computer game (Avalon Hill). And of course, those wacky guys at Infocom came out with the first game in their comedy series, *Leather Goddesses of Phobos.* You can play the game at any of three "naughtiness" levels (tame, suggestive, lewd) and the package includes seven scratch-and-sniff labels.

In the category I call "weirdware," there was a rash of fascinating products. Broderbund continued their string of hits with *The Toy Shop,* which prints out jet-powered dragsters and other toys that really work. Other desktop publishing triumphs were Simon & Schuster's *The Great International Paper Airplane Construction Set* and Springboard's simple *Certificate Maker.* First Star packed 13 useful and practical programs into one disk and appropriately titled it *The Works.* And Nolo Press gave us the one program that should last a lifetime—*Will Writer.* It makes it possible to write and print out a legal last will and testament in about 15 minutes.



Mind Mirror







UPI/BETTMANN NEWSPHOTOS

Dr. Timothy Leary

"I see the computer as an electronic mirror of the mind...It allows you to take any thought or concept and slice it, microscope it, magnify it, plot it or change it."

Dr. Timothy Leary

"They tell me all the time about computers being fixed. But nothing is fixed."

Sergio Echezabal, who had been declared dead by the Social Security Administration, in USA Today

TRENDS AND BUZZWORDS

"Desktop publishing" replaced "artificial intelligence" as the buzzword of the year. The computer industry certainly doesn't ever lack jargon. This year the world learned about the Amiga's "multitasking," which is a fancy way to say "do more than one thing at a time." "Desk accessories" also popped up everywhere, in programs like *Partner 128* (Timeworks), and *Desk Manager* (Softsync). Now our calculators, calendars and note pads are conveniently on-screen.

Next year's buzzword may very well be "CD-I." All the people who were buzzing about CD-ROM last year are now touting this new compact disc format invented by Philips and Sony. While CD-ROMs store only text, CD-I (Compact Disc Interactive) discs store text, graphics and sound. So after you blast out Springsteen, you can plop on another disc to read an interactive encyclopedia or 100 years of baseball statistics. These should be hitting the market in 1987.

ALL THE NEWS THAT'S FIT TO PRINT (AND SOME THAT ISN'T)

If you scan the papers, you'll see that computers are invading every aspect of society. On the front page, we saw that 30 computer aides in Manila walked off their jobs, charging that the election of Ferdinand Marcos was rigged. In New Jersey, seven teenagers were arrested for using their home computers to steal "codes that would cause communications satellites to change position," according to *The New York Times*. The headline in *The New York Post*: "WHIZ KIDS ZAP U.S. SATELLITES."

The U.S. Justice Department nabbed its first software pirate this year—Thomas Taylor of Lake Tahoe, California. He was convicted of copying and selling a word processing program. The FBI also posted their "Ten Most Wanted" list on-line for the first time.

Halley's Comet came and went, and those who didn't see the dirty snowball in the sky could see it on their computer screens with *Halley's Comet On Your Home Computer* (S & T Software). In the sports section, we saw that the Philadelphia Phillies started using an Amiga to do scoreboard graphics.

In the business section, we saw that Broderbund Software had became the 12th fastest growing private company in the U.S. (according to *Inc. Magazine*), and that Microsoft announced a public stock offering. Other companies didn't do as well. Infocom merged with Activision, which also acquired Creative Software. Hayden joined forces with Spinnaker, and



"Q: 'How can a person be assured of getting the very latest in computers? A: 'Easy! He just has to buy a new computer every Monday."

Mad Magazine



UPI/BETTMANN NEWSPHOTOS

Ferdinand And Imelda Marcos



UPI/BETTMANN NEWSPHOTOS

"You could punch a computer and find out what boats your parents came on."

***Lee Iacocca on the new museum at Ellis Island, in* Time**

Burroughs acquired Sperry. Blue Chip Software was acquired by The Encyclopedia Britannica. Two more computer magazines—*Creative Computing* and *Popular Computing*—bit the dust.

But the most significant news story of the year occurred on January 28th when the space shuttle Challenger exploded before our eyes, instantly killing its crew of seven. The previous August 25th, computers halted the space shuttle Discovery seconds before lift-off. On January 28th, NASA computers didn't detect any problems and we all know what happened.

A similar glitch occurred in the Union Carbide computers in Bhopal, India, on December 3rd, 1985. If any good came out of these tragedies and the one at Chernobyl, it was to remind the world of the danger—as well as the power—of technology. We were taking it all for granted, forgetting the complexity of shooting a rocket into space and bringing it home safely.

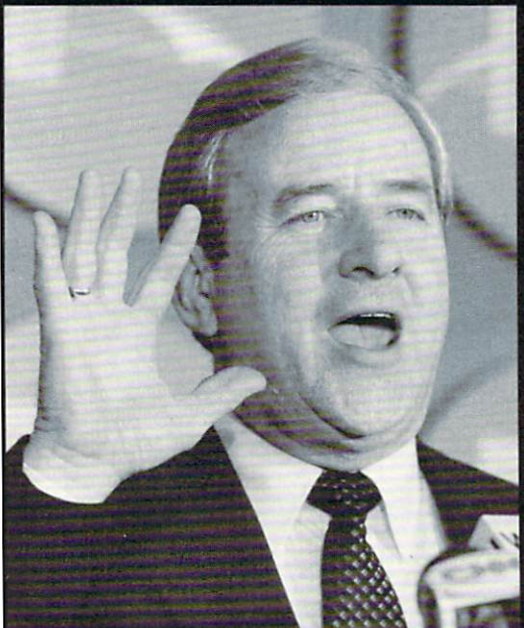
But 1986 was by no means a gloomy year in computing. A man in Atlanta programmed his computer to dial Jerry Falwell's toll-free number every 30 seconds for nine months, a joke which cost the Reverend half a million dollars. British television created Max Headroom, the first computer-generated talk show host. This was the year that plastic surgeons started using computers to design on-screen nose jobs.

Jackie Shapiro, a New York designer, created the first fashion collection on computer. Most of Mick Jagger's *Hard Woman* video was created with a Cray X-MP computer. Kentucky Fried Chicken™ started using microprocessors to regulate time and temperature of its cooking. In its first counting ever, the Census Bureau recorded 5,535 robots.

Israel released the first coin with a hologram embedded in it, and the U.S. Postal Service issued its first computer-designed stamp —a picture of Statue of Liberty sculptor Frederic Bartholdi. Computer-based image processing revealed that Leonardo da Vinci originally gave the Mona Lisa a necklace, but painted it out in the final version. Computers were also used in an archaeological dig at Little Bighorn, actually revealing the direction of gunfire in the legendary battle that killed General Custer and 225 other men.

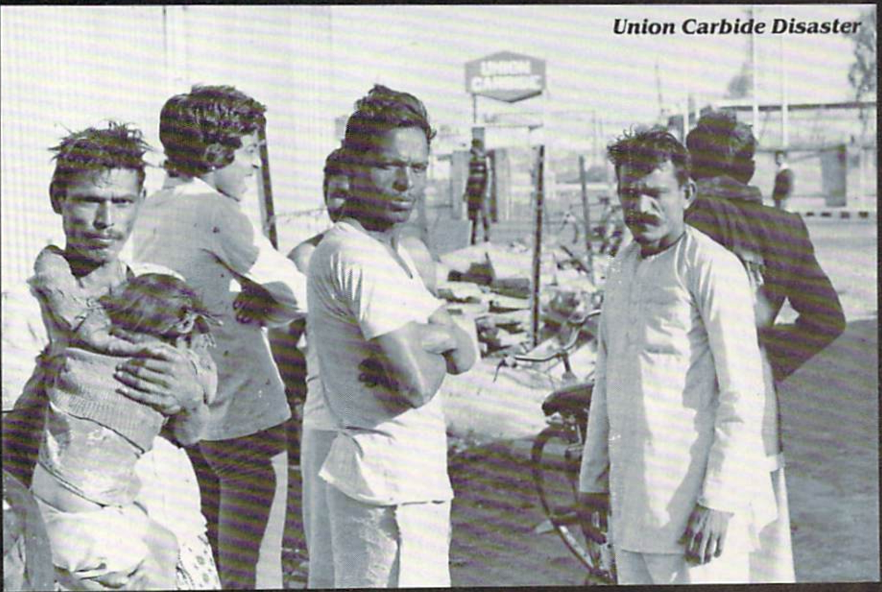
Finally, a week after the Libyan air strike, somebody realized that MicroProse's *F-16 Strike Eagle* includes a Libyan air combat mission in which you aim at ground targets in Tripoli and Bengazi. Sid Meier, who wrote the program, said, "Never did I imagine that this scenario might one day become a real-life international crisis."

A wild and wacky year, to say the least. And as Al Jolson said in *The Jazz Singer,* "You ain't heard nothin' yet, folks!"



UPI/BETTMANN NEWSPHOTOS

Reverend Jerry Falwell

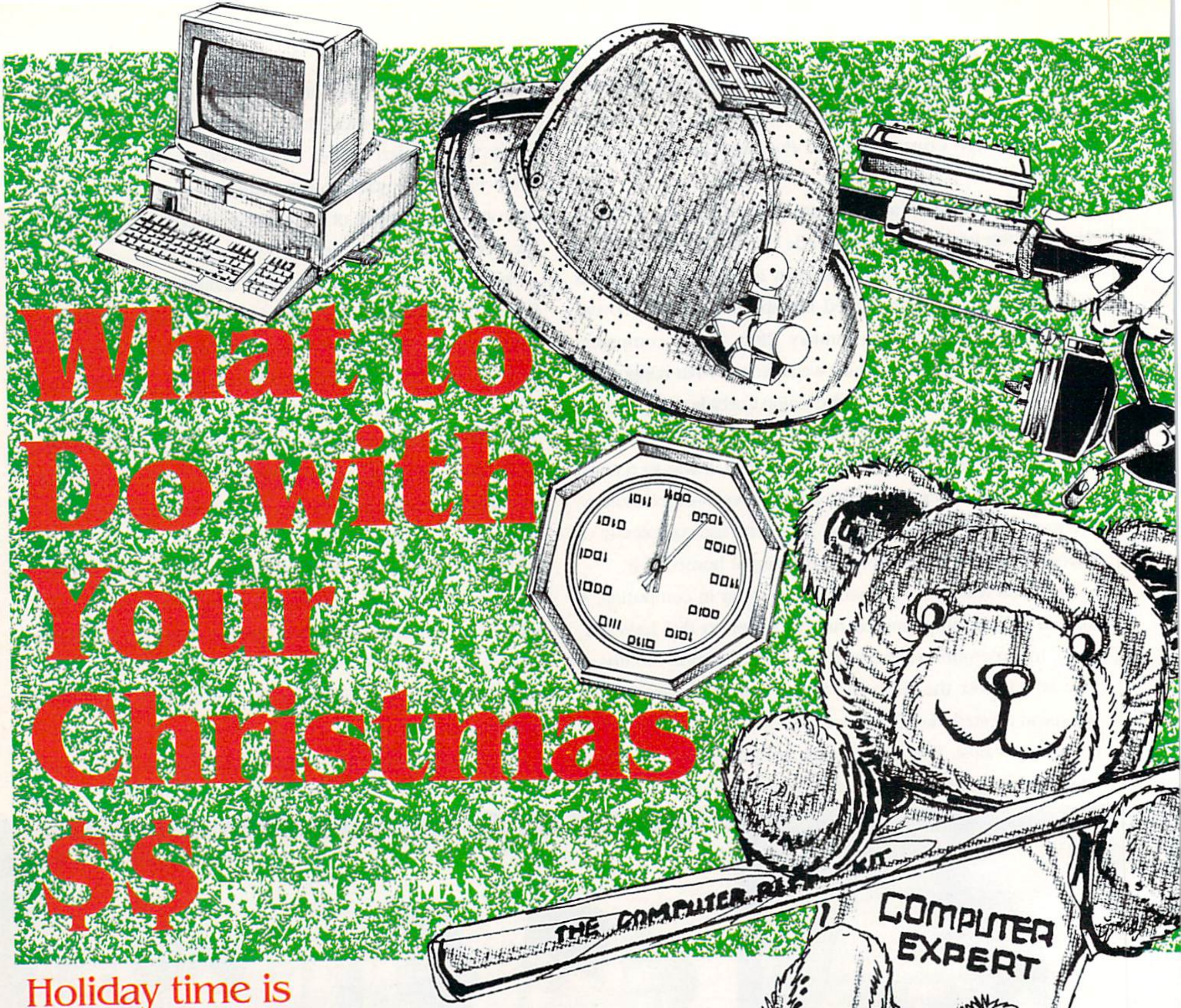


Union Carbide Disaster

"Within three years, one super computer will be able to process as much information in one second as 1,000 individuals could process in their lifetimes."

***Thierry Breton, co-author of the high-tech thriller* Softwar**

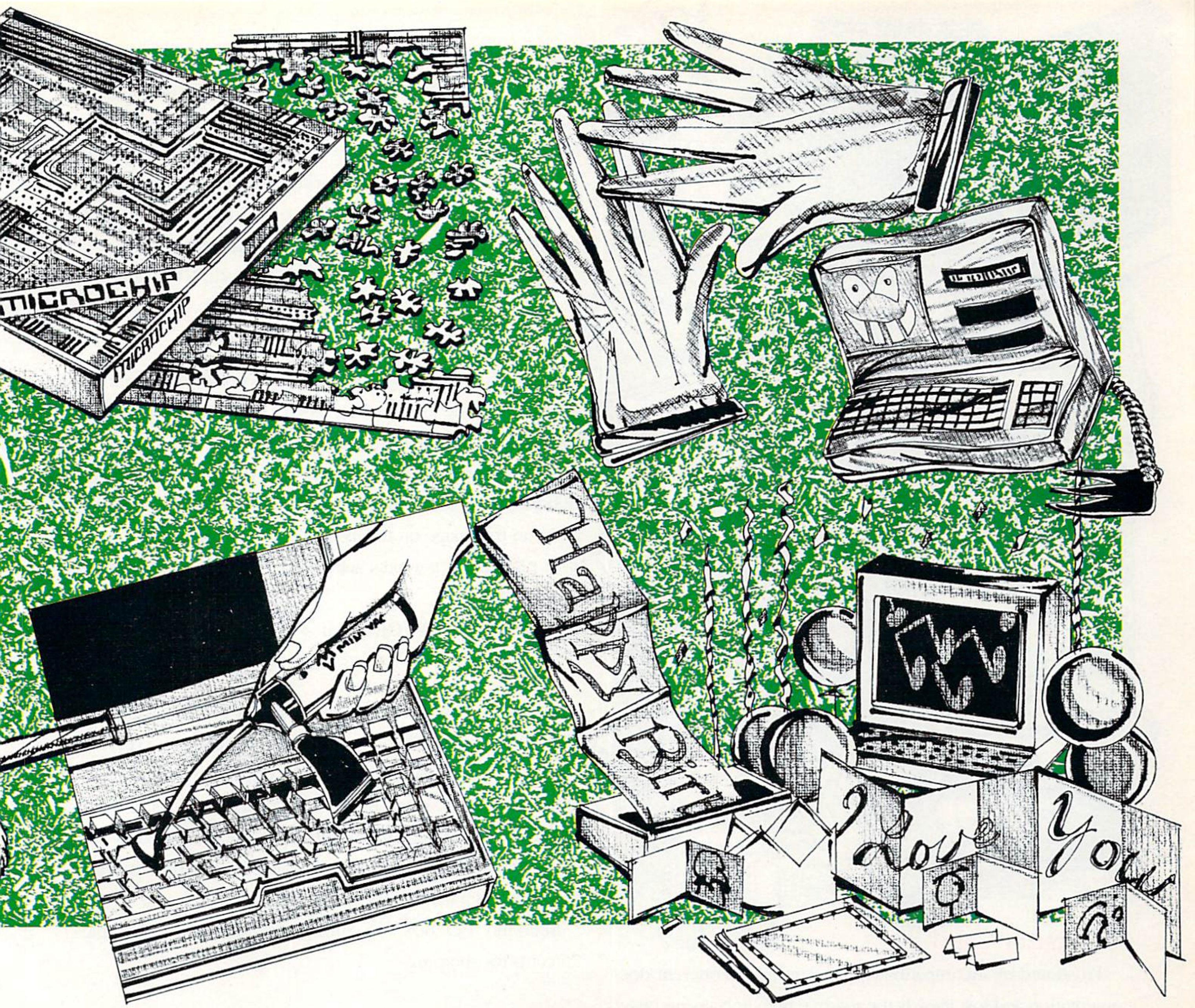
What to Do with Your Christmas $$



BY DAN GUTMAN

Holiday time is different for computer lovers. We don't lust after new clothes or golf clubs. We want our stockings stuffed with multifunction cards, file servers, quadboards, bus extenders and other things with equally weird names. Those things don't make such hot presents, but here are a few ideas that might be a good way for the computer lovers in your life to spend their Christmas money. Remember, it's better to give than to receive. Especially when you receive some of this stuff.





Nothing More Than Feelings

Tell Hallmark to take a hike. Who needs their cheesy, half-baked sentiments when we can word process our own cheesy, half-baked sentiments? CompuGreet's line of computerized greeting cards are perfect for just about any occasion—Christmas, Wedding, Anniversary, Thank You, Invitation, and New Baby. There's a colorful drawing on the outside, and you create the message for the inside. Cards and envelopes are on continuous fan-fold tractor feed paper.

CompuGreet, P.O. Box 3357, Reston, VA 22090. 20 cards—$9.95. 100 cards—$45. 300 cards—$130. Add $2 for shipping.

Hair Conditioning

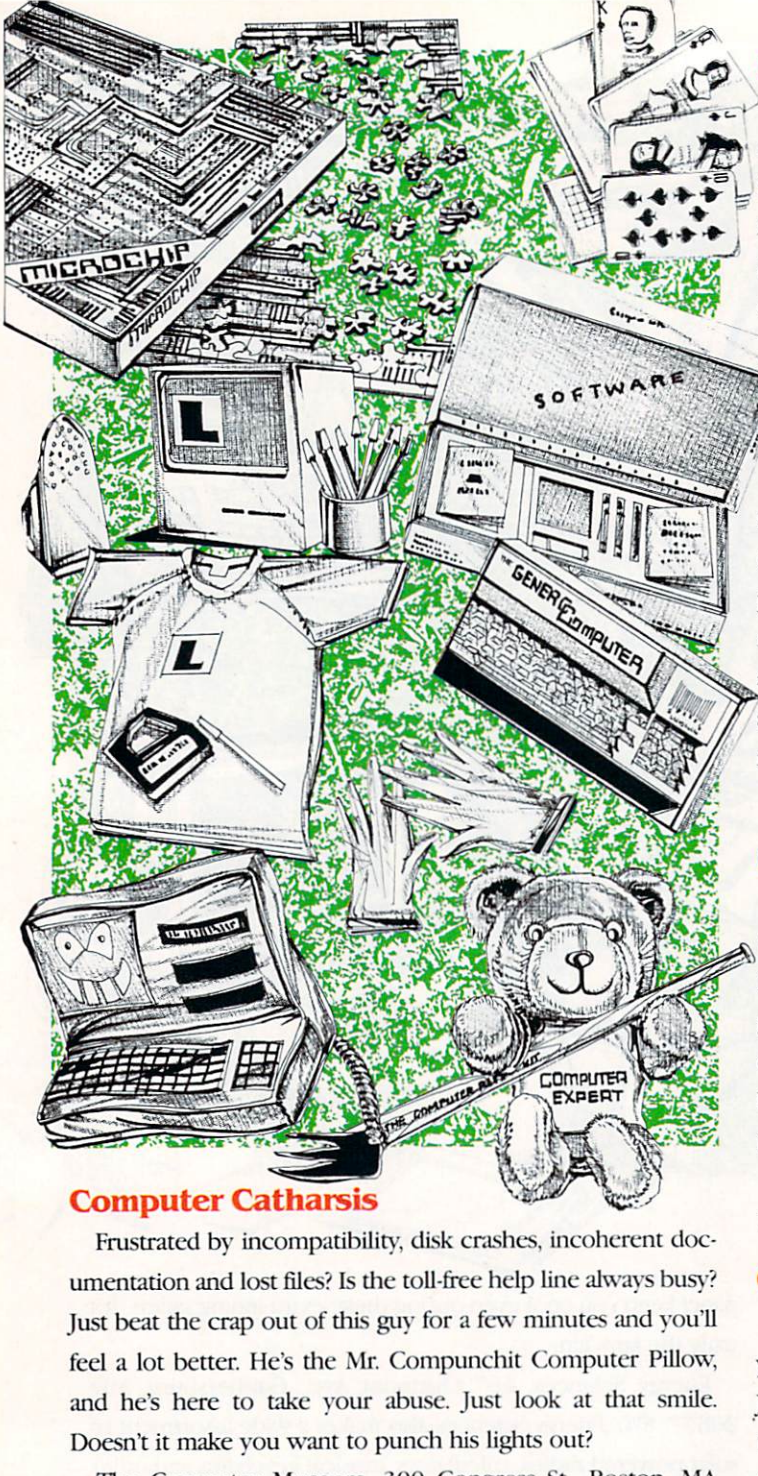
First there was the incandescent light bulb. Then the phonograph. Now comes the invention of the century—the Solair Cool baseball cap and pith helmet. The built-in fan and solar panel keep you cool even during those extra inning safaris. It's truly the fan's fan.

Energy Sciences, 167 Oakmont Ave., Gaithersburg, MD 20877. $70. Energy Sciences also makes a wide assortment of solar-powered radios, calculators, musical keychains and other toys.

Cuckoo Computer Clock

They say nobody wants digital clocks anymore. How about binary? What time is it when the big hand is on the 0100 and the little hand is on the 1001? Time to realize that you're living in a binary world. Finished in simulated walnut, this quartz clock displays time in large easy-to-read binary digits. AA battery not included. Impress your friends!

Sweet Gum, 15490 N.W. 7th Ave. , Miami, FL 33169. $40. Add $3.50 for shipping. Sweet Gum also makes binary watches for men and women.



Computer Catharsis

Frustrated by incompatibility, disk crashes, incoherent documentation and lost files? Is the toll-free help line always busy? Just beat the crap out of this guy for a few minutes and you'll feel a lot better. He's the Mr. Compunchit Computer Pillow, and he's here to take your abuse. Just look at that smile. Doesn't it make you want to punch his lights out?

The Computer Museum, 300 Congress St., Boston, MA 02210. $21.50.

Shut Up and Deal

You'll be playing with a full deck once you get these nifty Pioneer Playing Cards. They're the first cards with real heroes of the computer age on the back—Pascal is the Jack, Ada Lovelace is the Queen, and Charles Babbage is the King. The backs of the cards are white, with an orange or grey core memory pattern. Perfect for down time. Not to be used as expansion cards.

The Computer Museum, 300 Congress St., Boston, MA 02210. $9.95.

North Pole Position

Help! Santa's reindeer have gone berserk! You've got to round them up or there ain't gonna be no Christmas next year. Santa's Reindeer Game is one of five holiday games on *Ho! Ho! Ho!*. In the others, you'll be sorting presents, trimming trees, and directing Santa in his first TV special. Great fun for everyone, from the beginning elf to advanced gnomes.

Random House, 201 E. 50th St., New York, NY 10022.

It's Hardware! It's Software! No, It's Underware!

What good are computer graphics if you only see them onscreen? With the Underware Colorpack you can print up your own T-shirt designs. First you design your art with a graphics program and print it out on paper with the special Underware ribbon. Then color it in with five Underware felt tip markers and iron the image on to any T-shirt. Voila! You've got a washable, permanent personal statement. 30-100 impressions per ribbon.

Diversions, 505 W. Olive Ave. #520, Sunnyvale, CA 94086.

No-Tech

At last! The first full-function computer to sell for less than $10. The Generic Computer is truly the machine for everyone. It comes with its own letter-quality printer (a pencil), color graphics (crayons), and a data link (paper clip). It's portable, cordless, compatible with everything, and can be used by anybody. The perfect gift for the computer lover who has everything, except a laugh once in a while.

Intec Inc., P.O. Box 764, Springfield, OR 97477. $5.95 plus 75 cents for shipping.

Chips Ahoy!

If you've been having trouble proving to the authorities that you're legally insane, spend a few hours with this Microchip Jigsaw Puzzle. It's an actual photo of an Intel chip, blown up to 18″ by 18″ and chopped into more than 500 pieces. Suitable for framing, or building a small house upon, but don't try to put it in your computer.

Sweet Gum, 15490 N.W. 7th Ave., Miami, FL 33169. $8.95. Add $2 for shipping.

Daryl Strawberry

He's soft. He's furry. He's washable. He knows more about computers than most salesmen. Put this 18-inch hardwood "Computer Repair Kit" in his hand and you can kiss those syntax errors goodbye forever. He probably won't fix your Amiga, but it's a lot cheaper than bringing it into the shop.

Sweet Gum, 15490 N.W. 7th Ave., Miami, FL 33169. $19 for the bear, $9 for the bat. Add $2 for shipping.

The Ultimate Desk Accessory

Once you buy a computer, drive, monitor, modem and cables connecting them, you might as well buy a new house to store it all. Organize your workspace! The Command Center lets you consolidate all your C128 peripherals into one neat cabinet. It includes a built-in fan, modem switch, surge protection and a power strip with six outlets. It's even got a master AC switch, so you won't have to end up in traction anymore trying to turn on your computer.

Ketek, P.O. Box 203, Oakdale, IA 52319. $150. C64 version is $120.

Something Fishy

Don't just tell your friends about that one that got away—*show* them. This Computerized Fisherman's Fight Recorder attaches to any fishing pole and uses a microcomputer chip to record each fight's maximum force, total force, and elapsed time (up to 99 minutes). Battery included. Also perfect for reluctant tooth extraction patients.

Hammacher Schlemmer, 1-800-543-3366. $75.

It's All in the Wrist

Throw away those mice, joysticks, touch tablets, and other 'alternate input devices." Get a grip on yourself with HandCommand. It's a lightweight cotton glove with sensors in it that measure the position, tilt and bend of the hand in three dimensions. In other words, you just lift a finger and something happens on-screen. Think of it! You can throw imaginary darts, conduct an imaginary orchestra, play imaginary air guitar or use your imaginary imagination. You've got to hand it to...

ShareData, 7122 Shady Oak Rd., Eden Prairie, MN 55344. $40.

The Clean Machine

Now here's a product that really *sucks!* Mini-Vac is a lightweight, portable vacuum cleaner that was specifically designed to remove tiny particles of dust and debris from those tight places. Unlike compressed air, which simply blows the dirt around, Mini-Vac gets rid of it forever. Prevent waxy yellow build-up on your keyboard! AC or DC power.

Mini-Vac Inc., 217 S. Orange St. #4, Glendale, CA 91204. $20.

Here, There, and Everyware

How do you make a computer lover love you more than their computer? Try *HeartWare,* a personalized love note card maker. It includes a three-minute animated message set to music. If that doesn't work, try *CardWare* (three minutes of animated birthday greetings set to music), *PartyWare* (prints out banners, party hats, party games, and thank you notes), *Jingle Disk* (animated holiday story) or *WareWithAll* (supply kit with 80 sheets of colored paper, stickers, markers and envelopes).

If that doesn't work, hang it up. They probably just don't like you.

Hi Tech Expressions, 2699 South Bayshore Dr. 1000-A, Coconut Grove, FL 33133. $10-$15.

The Ultimate Computer Game

This is the first computer game that's compatible with all brands—Computerize. The first player to acquire a complete computer system without forfeiting any members of the family is the winner. (That's tougher than you think!) The game-in-a-tube includes the game board, 40 application cards, 40 Bits & Bytes cards, shopping lists, money, dice, playing pieces, and State-of-the-Family cards. For nuts and novices aged 10-100.

The Computer Museum, 300 Congress St., Boston, MA 02210. $20.

Calling All Hitchhikers

As you know, it's a special kind of guy or gal that can get the babel fish. If you're one of the few, the proud, you should tell the galaxy with this 'I Got the Babel Fish" T-Shirt. It's certainly better than carrying around the fish with you all the time. If you don't know what we're talking about, you probably don't want the shirt anyway. Available in all sizes.

Infocom, P.O. Box 478, Cresskill, NJ 07626. $7.95.



Chocolate Chips

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From America's Cup to OutrAegis '86

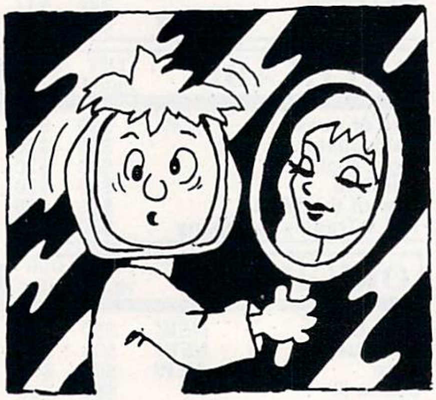
Aegis Development is moving in new directions. In late July they sponsored OutrAegis '86. Here Aegis announced that they are beginning to develop products for the CD-I marketplace. Another announcement was that **Aegis Images** and **Aegis Animator** would be upgraded.

According to Jeff Bruette, head of Amiga Product Development at Aegis, Aegis is moving away from creating new paint programs in favor of enhanced animation products. What this means in terms of new software is that **Aegis Images** will get a face lift: easier to use interface and more items in the "fast menu," but most of Aegis' efforts will go into upgrading **Aegis Animator.**

Aegis Animator's menus will be completely redesigned, and a new feature called CEL PAINT will be added. This will be used to manipulate images used in cel animation, such as frame flipping, perspective controls, pixelation, and enhanced control over windows and backgrounds. A new requestor will be used to control the time between "tweens" in 1/60, 1/30, or 1/24 of a second increments. Also, when an object is moved about on the screen, you will now see the entire object while it is being moved, not just an outline.

A text editor will be added. This will be used to edit the animation scripts that **Aegis Animator** creates. These have not been well documented to date, but that will be changed in the new manual. By manually editing the text scripts, much finer control can be achieved over animation events. The ability to have sub-animations or recursive events will also be a new feature. You will be able to create, save and load subroutines that can be added to any animation.

Of interest mostly to programmers, and potentially one of the most powerful additions, is a two-way message port. This is a means of passing information between the new **Aegis Animator** and other programs. This would allow a music program to control the playback of animations, the addition of a controller for step-frame video recording, or even the playback of selected animations based on the bottom line of a spreadsheet. Think of it as a programmer's player program. Two other items include a toggle to turn interlace on (while recording on a VCR), and possibly the removal of the overscan border during playback.



Second in the series of CAD programs from Aegis is **Draw Plus.** This is a new version of **Draw,** but it is not **Draw Pro.** It features several new functions: mirror; ellipses; text entered on-screen instead of in a requestor box; display of the length and angle of a line while drawing; and the ability to run in high-resolution mode. It also has an array function for duplicating repetitive elements in a drawing, such as teeth on a gear, and a "hook" for changing the shape of an element, similar to the one in **Aegis Animator.**

It also looks like Aegis will be publishing **MusicCraft** under the company name Sonics. This new version of the software will include MIDI capability and will store songs in IFF format.

Finally an update on Aegis' **Diga.** This on-again/off-again telecommunication product is on again. The most remarkable new feature is the ability to send and receive files simultaneously, while also allowing two users to have a chat mode active as well.

Activision is rapidly becoming the entertainment capital of Silicon Valley. Not content with releasing a game based on the Rocky Horror Picture Show, they have bought the rights to four other motion pictures: Aliens, Labyrinth, Howard the Duck, and Big Trouble in Little China.

I've talked about **InfoMinder** from **Byte By Byte** in this column before, and now Jim Becker has improved the program considerably. He demonstrated a system that integrated an Amiga, **InfoMinder,** Genlock, and a laser disk player. Images could be found using an **InfoMinder** application as an index, and either displayed on a separate monitor or underlayed on the Amiga's screen using the Genlock. This product just keeps getting better.

Byte By Byte is also producing a real-time clock for the Amiga. It will plug into the second mouse port, and is about the size of the plug on the current mouse. It will include software to display and set the time (a clock with hands you can pick up and move using the mouse), a screen shutdown option that will turn the display off when you haven't used the keyboard or mouse for awhile, an auto-front program that will bring a window to front whenever you click anywhere in that window, and other utilities. If you need the port for other uses, you can unplug the clock once the system has read the time from it.

Digital Engineering has just finished a new video digitizer for the Commodore 64 called Eye Scan. It uses a slow scan method to translate a video signal into a bit map. It can digitize to eight levels of gray, and will store images in either **Doodle!, Koala, Blazing Paddles** or **Animation Station** formats. There are adjustments for the sync and level values. The software uses pop-up windows to explain how to use the hardware, and includes routines and documentation on how to include images in your own software and how to write your own applications. A slideshow program is also included that displays each picture in sequence, fading them in and out, with adjustable delays between each image.

Digital Engineering is also working on an audio sampler for the 64. It will sample at up to 25 Kcycles at eight bits. Supporting software will include digital delay, echoplex, reverb, phase shift and other special effects. The program will be menu-driven using pop-up windows. The samples will be displayable as a waveform, and can be up to four seconds in length. There will also be a MIDI capability, so you will be able to use the samples as patches on several synths, and send MIDI data directly to connected MIDI equipment.

Electronic Arts has two new games for the 64. The first is **America's Cup,** a one-on-one competition sailing game. This will feature a new use for the joystick. You must wind the joystick handle in a circular motion to winch the sails up and down. The other new game is **Star Fleet 1,** an interstellar strategy game from Interstel Corporation (see the review in the September/October, 1986, **Commodore Microcomputers**). EA's Earl Weaver baseball game for the Amiga is currently planned to ship in mid-January.

Bug Tar Press has started a new newsletter on computer games. This is an

SILICON VALLEY

intellectual's look at gaming, not just a set of reviews. The editor/publisher is an old hand at computer games, Scott Mace.

The gang at **A Squared** (designers of the **Amiga Live!**) is working on a project for NASA. They are creating some custom hardware and software that will be used with a special camera to monitor temperatures on the space shuttle's surface prior to launch. The camera will operate in the infrared spectrum and will send not only infrared information but visible spectrum data, position data and gas-emission data. The software will correlate all of this information, and allow engineers to evaluate conditions on the shuttle's surface until moments before launch.

Amazing Stories is using Amiga computers to create special effects for one of their episodes. I'll be covering this in more detail in the months to come. **Lawrence Livermore Labs** are using Amigas as front ends to talk to their Cray computer.

SubLogic has finished **Flight Simulator** for the Amiga. Features include viewing the plane from outside, full window display, stereo sound effects, movable windows for the cockpit and for map display, and vertigo-inducing response.

That wraps it up for this month. I hope the holidays are a happy occasion for all of you, and I look forward to a happy new year for us all. Until then, that's all from the valley. ■

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Oakland, CA 94619

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Mountain View, CA 94043

Aegis Development
2210 Wilshire #277
Santa Monica, CA 90403

Bug Tar Press
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Baltimore, MD 21209

Byte By Byte
3736 Bee Cave Road #3
Austin, TX 78746

Digital Engineering
2718 S.W. Kelly C-119
Portland, OR 97201

Electronic Arts
1820 Gateway Drive
San Mateo, CA 94404

SubLogic
713 Edgebrook Drive
Champaign, IL 61820

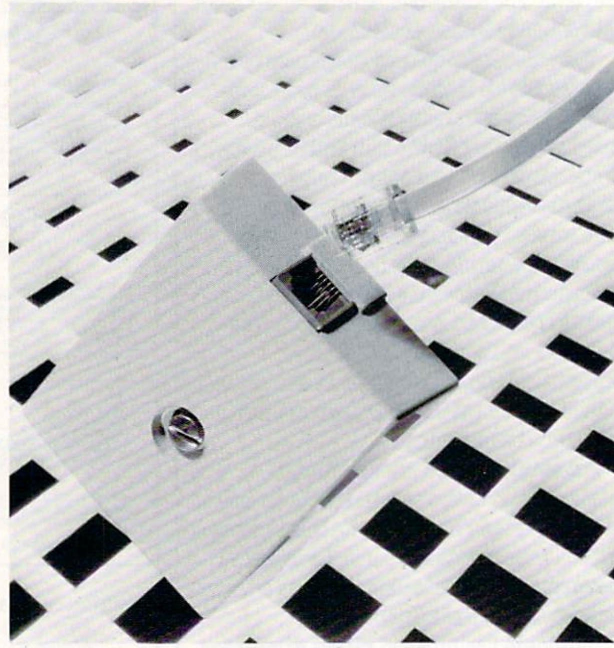
BY SUZANNE McCOACH AND DAN SCHEIN

Connect!

A Guide to Telecommunications Literacy

Become an on-line expert in this ongoing telecommunications tutorial.

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Telecommunications is one of the most exciting areas of personal computers. Unfortunately, there seems to be a shortage of how-to articles for beginners. We aim to change this.

Telecommunications is the process of using a computer, modem and terminal software connected to a phone line. This enables you to access other computers, bulletin board services, data bases and nationwide consumer networks.

Our column will include a series of articles that start with the basics. In phase one, we will include technical terms and tips, types of equipment needed to telecommunicate, and differences between the many types of software and hardware. And, most importantly, we will teach you how to connect your modem.

Phase two will include samples of services available, the type of information found on the services—along with sign-up procedures, access costs, free services, and bulletin boards. Networks vary greatly between the types of members and the programs and services available. You need to see several types of networks before you can decide which best suits your needs.

In phase three, more advanced topics will be discussed: new applications, program and file transfer, just to name a few. We will be keeping you abreast of the latest developments in the telecommunications world.

To get you started, we have included a list of the most commonly used technical terms. You may want to keep this list on hand as a reference to use in the upcoming articles.

Feel free to send in any telecommunications questions you may have along the way. We will be glad to help you. Send them to Commodore Business Machines, 1200 Wilson Drive, West Chester, PA 19380, ATTN: Communications Department/Telecommunications Group. We regret that we will not be able to answer each letter individually, but we will share the most common questions in upcoming articles.

Suzanne McCoach is Telecommunications Manager at Commodore. Dan Schein is Network Coordinator.

ANSWER/ORIGINATE MODE
A mode of operation describing the sending or receiving of data from one computer to another. When your modem is in the originate mode, you dial the telephone to a receiving computer. If your modem is in the answer mode, then you receive the call from the remote computer.

ASCII
The abbreviation for American Standard Code for Information Interchange. ASCII is the code that represents the characters on the keyboard. Standard ASCII uses seven bits to represent a character and Commodore ASCII uses all eight bits (one byte) to allow an extra 128 graphic characters. An ASCII conversion routine (terminal software) is necessary to communicate between a Commodore system and a standard ASCII device such as a host computer.

BAUD
A unit of measurement for the transmission of data which translates into bits per second. If your modem is set on 300 baud, it is transmitting 300 bits per second. If set at 1200 baud, 1,200 bits per second are transmitted.

BIT
The smallest unit of information in a computer system. A bit may be either "off" representing zero or "on" representing one.

BUFFER
A temporary storage area, usually in a computer's memory. The data is stored in the buffer and later output to tape, disk or printer, or acted upon by the computer program currently in memory. Peripheral devices such as disk drives and printers can also have their own buffers to temporarily manage and store data.

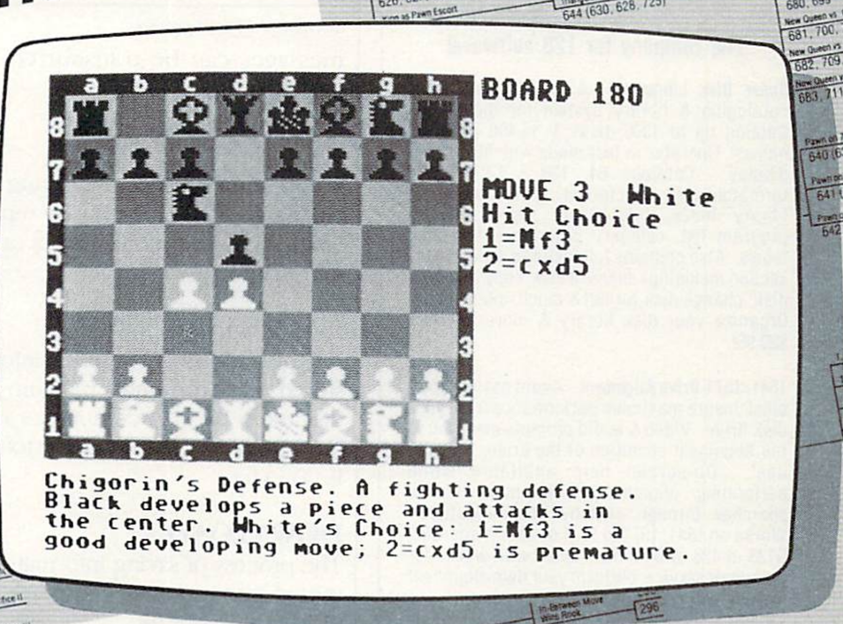
BULLETIN BOARD
An electronic public storage medium within an information network where

Continued on pg. 86

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- Stalemates
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- Fianchettoes
- The Lucena Position
- King & Pawn Endings
- The Active Rook

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- Bird's Opening
- Larsen Attack
- Sokolsky's Opening
- Benko's Opening
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Continued from pg. 84

messages can be transmitted and received.

BYTE
A unit of information consisting of combinations of bits. A byte may represent a letter, number, special symbol or control information.

DATA BASE
A large collection of related information stored on a computer medium such as disk, tape or in a computer's memory. Data bases are often available to the public for a fee.

DOWNLOAD
The process of saving information transmitted from another computer to your disk, tape or printer.

DUPLEX (full)
A computer in full duplex mode will "echo" back to the sender's screen all signals it receives. This checks information against loss or alteration. It is similar to speaking to someone who repeats every word you say. The half duplex mode of operation does not "echo." It is similar to normal conversation between two people.

ESCAPE CODES
A special character used in telecommunications to indicate that the succeeding character is different than the characters making up the actual message. The standard escape character is CHR$(27), which usually signifies that the following character will be a control character in an escape sequence that may include such directions as clear screen or position cursor.

FILES
Collections of information on disk. Files may consist of programs or text information.

HOST/REMOTE COMPUTER
In telecommunications, the host is the computer that receives a call from the other computer. The host controls the processing while the computer that originated the call (the remote) acts according to the way the host dictates.

INFORMATION SERVICE
An electronic information source, usually maintained on a large computer/mainframe, that provides information to other computers through telecommunications. Information services may contain world and national news, stock quotes, shop-at-home services, and public domain software areas.

MODEM (Modulator/Demodulator)
A communication device that acts as an interface between a computer and a telephone. It allows electronic signals from one computer to be sent across standard telephone lines to another computer.

ON-LINE
The state of being connected to a host computer as a terminal.

PARITY
The agreed upon definition of valid bit combinations in a character. The parity bit is used as a checking mechanism to determine if transmission has been complete. Parity may be even, odd, mark or space.

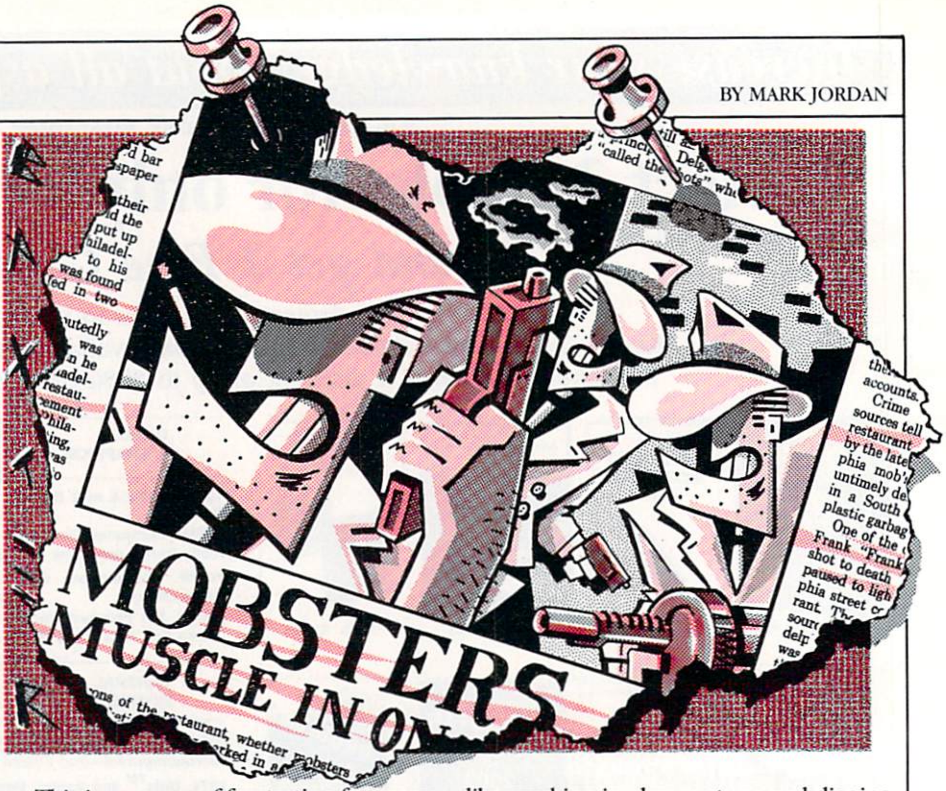
PROTOCOL
The appropriate settings or parameters required for accurate sending and receiving of information during a telecommunications dialogue. The protocol includes parameters such as duplex, parity, word length and baud.

STOP BIT
A bit that signals the end of a character being transmitted.

TERMINAL MODE
This is the interactive portion of a terminal program. Here is where you do your talking and receiving with other systems. Whatever you type is sent through your modem and whatever your computer receives is sent to your computer's screen.

UPLOAD
The process of transmitting a file or the contents of your computer's memory to the memory of another computer where it can be saved to disk, tape or printer.

WORD LENGTH
The number of data bits in a telecommunications word or unit of data transmission. Usually seven or eight (plus start bit, stop bit(s) and optional parity bit). Most programs default to one start bit, eight data bits, one stop bit, and no parity for a total word length of ten bits.



Mobsters!

Sprites I Have Known for the Commodore 64 and 128

Actually, Mobsters are not all that wily a bunch. You'll find that E and I and K and L are really quite friendly chaps. But I call them Mobsters because they have one thing in common—they are all Movable Object Blocks (MOBs), the technical name for sprites.

What are Mobsters good for? Well, they're great for title screens and moving messages. While you're limited to only eight at a time (unless you enjoy doing raster interrupts) on the 64, you can spell out some delightful moving messages.

Commodore 128 owners can do even more by using Mobsters and GSHAPES on a bit-mapped screen. It's a breeze in BASIC 7.0.

How to Use Them

Type the programs in and save them. You have five different programs to type in. Program 1 is for when all the others are typed and saved. It demonstrates these whimsical little guys in action. Also built in is an explanation on how to use them in your programs.

Commodore 128 owners can type them in stages, any of the programs 2 through 5. You can run them individually—they'll save in a binary save automatically and also be viewable as sprites. Use the SPRDEF commands to look at them.

Commodore 64 owners have a slightly different situation. Because the 64 doesn't support hexadecimal numbers, nor any of the luxurious sprite commands on the 128, I have added programs 6 and 7. Use program 6 with each data program (2 through 5). That is, type program 6 in, save it, then be sure it's loaded before you begin typing in programs 2 through 5 so it becomes a part of those programs. Program 7 is for your enjoyment.

The Art of Designing Sprites

Sprites are like the sonnet or haiku in poetry, a restrictive art form. You've got a 24-by-21 canvas to work with. As in needlepoint, you cannot expect to have flowing curves and perfect edges.

This is a source of frustration for many sprite artists. They want to make a face. They know that a face is round. They want eyes, a nose and a mouth in the face. Lips would be nice. Hair. Ears. How about some eyebrows? Things are getting crowded. It begins to look like a pizza. If it were done on paper, they would rip it up or crumple it. Instead, the sprite artist grows more frustrated.

It doesn't need to be. Work with your restrictions. Cartoonists know how to caricaturize by exaggerating prominent features—and you should too. Okay, so there isn't room for lips and teeth. How about just a big pair of lips? I've found that a pair of eyeglasses (better yet, sunglasses) is about the only real feature needed to give a face a friendly look (see J).

If a nose is necessary, make it the dominating feature on the face as I tried to do with Mobsters E and F. You could even put the eyes on its sides.

Conversely, sometimes understating features is a more effective method. Notice that many of the Mobsters have tiny little two-pixel eyes. This technique of "smallifying" features gives an innocent look that's hard not to like.

As for oblique lines, there are a few rules. The closer an oblique line is to 45 degrees, the smoother it will look. If you're making a pair of walking legs, have them either horizontal, vertical, or at 45-degree angles. The mouth of K was easy to add teeth to because of the 45-degree jaws.

In all cases, don't attempt too much. A sprite is much happier with fewer features and lots of filled-in space. It's more like working in clay or stone and digging out features, rather than with a pencil that can etch them.

Finally, decide what your sprite is supposed to be and then let its function dictate its final form. The Mobsters were

That Glorious SPRSAV

You 128 owners don't know how good you have it. Not only can you use sprites quickly, you can also convert your creations into variables via SSHAPE/GSHAPE. Then, by using a bitmapped screen (also very easily done), you can have as many sprites on the screen at a time as you want—so long as they don't need to move.

The way you perform this transplant is with the SPRSAV command. Program 1 does this by loading in the sprites, eight at a time, in line 30. Then in the loop in lines 40-60, those sprite shapes are converted into variables. One loop begins by setting C and D to 1. Then line 50 changes sprite C (number 1 the first time through) into the subscripted variable AL$(D).

Line 60 loops back until C = 8 (all the sprites have been converted). When that happens, C is reset to 1, but not D. That way, since D is the index to the array AL$(D), it can keep incrementing until all the sprite programs have loaded and converted to variables.

To use the bit-map screen, study lines 100 through 120.

meant to be whimsical, friendly fellows with personalities, while retaining the general appearance of a letter in the alphabet. I used my three-year-old daughter as a judge. If she couldn't see what letter it was, it was no good.

The letters S and Z are naturals for serpentine-type characters. The letters O and Q just had to be "cousins," as did E and F. And how could Q possibly not have something sticking out of its mouth? V was a rabbit long before I noticed it hiding there.

I hope you use Mobsters in your programs. Basic 7.0 users will find it easy to modify these sprites. At any rate, watch out—they're Mobsters!

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007, 1-800-831-2694.

Program 1

```
10 COLOR 0,1:COLOR 4,1:COLOR 5,16
   :COLOR 1,3'EQQD
20 DIM AL$(32)'BHLY
30 DO:READ SP$:X=X+1:BLOAD(SP$)'FPYG
40 DO:C=C+1:D=D+1'FIJF
50 SPRSAV C,AL$(D)'BJAD
60 LOOP UNTIL C=8:C=0'EFPG
70 LOOP UNTIL X=4'DCMG
80 FOR T=3840 TO T+64:POKE T,0
   :NEXT'GNIK
90 DATA"SP.A-H","SP.I-P","SP.Q-X",
   "SP.Y-Z"'BDXM
100 GRAPHIC 2,1,15'BGEV
110 FOR I=0 TO 2'DDEX
120 FOR T=0 TO 8:GSHAPE AL$(T+I*9+1),
    T*35,I*40:NEXT:NEXT'LXXJ
130 WINDOW 0,15,39,24,1'BNVB
140 PRINT CHR$(14)"[SPACE2,L. BLUE,
    SHFT T]HE ABOVE [RVS] [SHFT M]
    OBSTERS [RVOFF] ARE [SHFT G]
    SHAPES."'CEPM
150 PRINT"[SHFT T]O SEE THEM AS
    SPRITES (IN COLOR), TYPE"'BAOL
160 PRINT"THE LETTERS YOU WISH TO
    SEE."'BAHJ
170 PRINT"[SHFT T]O SEE SPRITES MOVE,
     PRESS [RVS] [BACK ARROW] [RVOFF]
    ."'BAUL
180 PRINT"[SHFT P]RESS [RVS]
    [UP ARROW] [RVOFF] TO EXIT."'BAVJ
190 FOR T=1 TO 8:SPRITE T,0,T+1
    :NEXT'GMDK
200 Z=1'BCKW
210 DO:GET KEY A$:A=ASC(A$)-64
    :IF A$=" "THEN A=29'KRBH
215 IF A$="."THEN A=27'EFLF
216 IF A$="?"THEN A=28'EFEG
220 IF A$="[BACK ARROW]"THEN 270'DFPB
230 IF A$="[UP ARROW]"THEN 280'DFPC
240 IF A>0 AND A<30 THEN SPRSAV
    AL$(A),Z:MOVSPR Z,Z*35,214
    :SPRITE Z,1,Z+1:Z=Z+1'MMDQ
250 LOOP UNTIL Z=9'DCTE
260 GOTO 200'BDBD
270 FOR T=1 TO 8:MOVSPR T,270#5:NEXT
    :GOTO 200'GRIK
280 GRAPHIC 0,1'BDGF
290 PRINT"[CLEAR,HOME2,SHFT Y]
    OU MAY USE [SHFT M]
    OBSTERS IN YOUR PROGRAMS,"'BAOR
300 PRINT"BY PUTTING LINES 10-90 AT
    THE TOP OF"'BADG
310 PRINT"YOUR PROGRAM."'BAOC
330 PRINT"[DOWN,SPACE5,SHFT T]
    O USE AS SPRITES (LIMIT 8)"'BANI
340 PRINT"[SPACE5]INCLUDE LINES
    700-790."'BAHH
350 PRINT"[SPACE5,DOWN,SHFT T]
    O USE AS [SHFT G]-SHAPES
    (UNLIMITED)"'BAJM
360 PRINT"[SPACE5]INCLUDE LINES
    800-890."'BAJJ
370 PRINT"[DOWN,SHFT N]EXT, MAKE [RVS]
    MOB$[RVOFF] = TO WHAT YOU
    WANT"'BAJO
380 PRINT"PRINTED, MAKE [RVS] MX
    [RVOFF] = TO WHAT COLUMN,"'BAIP
390 PRINT"AND [RVS] MY [RVOFF]
     = TO WHAT ROW.[SPACE2,SHFT I]
    F YOU WANT"'BAAQ
395 PRINT"SPRITES TO MOVE, MAKE [RVS]
     MV [RVOFF] = TO SPEED."'BAJV
400 PRINT"[SHFT F]INALLY, [SHFT G,
    SHFT O,SHFT S,SHFT U,SHFT B]
     TO THE PROPER ROUTINE"'BAXL
405 PRINT"(700 OR 800)."'BAAG
410 PRINT"[DOWN,SHFT Y]
    OU MAY CHANGE ANY LINE
    NUMBERS."'BAAI
420 PRINT"[SHFT S]TUDY THESE LINES TO
    ENHANCE YOUR USAGE."'BAPM
430 DO:LOOP'CBRD
700 FOR T=1 TO 8'DDWD
710 AS=ASC(MID$(MOB$,T,1))-64
    :IF AS<1 OR AS>27 THEN AS=27'KDRP
715 SPRSAV AL$(AS),T:MOVSPR T,MX,MY
    :SPRITE T,1,T+1'ECTQ
720 MX=MX+30:NEXT'DHVG
725 IF MV>0 THEN FOR T=1 TO 8
    :MOVSPR T,270#MV:NEXT'IRJR
730 RETURN'BAQE
800 GRAPHIC 1,1:COLOR 1,3:MS=MX'DMCH
810 FOR T=1 TO LEN(MOB$)'EINH
820 AS=ASC(MID$(MOB$,T,1))-64
    :IF AS<1 OR AS>27 THEN AS=27'KDRR
830 GSHAPE AL$(AS),MX,MY'BNCJ
840 MX=MX+30:IF MX>320 THEN MY=MY+35
    :MX=MS'IXKR
850 NEXT:RETURN'CBXI
```

END

Program 2

```
10 FOR T=3584 TO 4095:READ A$
   :A=DEC(A$):POKE T,A:NEXT'IXXG
```

```
11 BSAVE"SP.A-H",BØ,P3584 TO
   P4Ø96'CPEE
12 REM <A>'BDXA
13 DATA ØØ,3C,ØØ,ØØ,7E,ØØ,ØØ,FF'BXVF
14 DATA ØØ,Ø1,FF,8Ø,Ø1,FF,8Ø,Ø3'BXKG
15 DATA C3,CØ,Ø3,81,CØ,Ø7,ØØ,EØ'BXBH
16 DATA Ø7,1C,EØ,ØE,ØØ,7Ø,ØE,ØØ'BXYI
17 DATA 7Ø,ØE,66,7Ø,1E,ØØ,78,1E'BXHJ
18 DATA 7E,78,1D,FF,B8,3B,FF,DC'BXOK
19 DATA 37,ØØ,EC,38,ØØ,1C,3E,ØØ'BXGL
2Ø DATA 7C,1E,ØØ,78,FF,ØØ,FF,ØØ'BXCD
21 REM <B>'BDYA
22 DATA 7F,FE,ØØ,FF,FF,CØ,FF,FF'BXSF
23 DATA FØ,FF,FF,F8,CØ,ØØ,78,FØ'BXWG
24 DATA 2Ø,38,F8,3Ø,38,F8,B1,3Ø'BXKH
25 DATA FC,38,6Ø,FF,FD,CØ,FF,FE'BXBI
26 DATA 8Ø,FF,1E,CØ,FF,7E,FØ,FF'BXHJ
27 DATA Ø1,FC,FF,FF,FE,F7,FF,DE'BXNK
28 DATA F7,FF,DE,FØ,ØØ,3E,FF,FF'BXYL
29 DATA FC,FF,FF,FØ,FF,FF,CØ,ØØ'BXJM
3Ø REM <C>'BDAA
31 DATA Ø1,FF,FØ,ØF,F8,8C,33,E7'BXGF
32 DATA FE,6D,9E,4E,5F,FE,4E,DF'BXMG
33 DATA Ø7,FE,E6,Ø1,FE,FC,ØØ,78'BXDH
34 DATA F8,ØØ,ØØ,F8,ØØ,ØØ,F8,ØØ'BXRI
35 DATA ØØ,F8,ØØ,ØØ,FC,ØØ,ØØ,FC'BXNJ
36 DATA ØØ,ØF,FE,ØØ,1F,FF,8Ø,7F'BXUK
37 DATA 7F,E1,FE,7F,FF,FE,3F,FF'BXFL
38 DATA F8,1F,FF,FØ,Ø7,FF,CØ,ØØ'BXPM
39 REM <D>'BDBJ
4Ø DATA FF,FF,ØØ,FF,FF,CØ,FF,FF'BXJF
41 DATA FØ,FE,Ø3,F8,FC,Ø1,FC,F8'BXMG
42 DATA ØØ,FE,F8,ØØ,7F,F8,ØF,BF'BXUH
43 DATA F8,FB,3F,E1,BØ,Ø7,E8,Ø7'BXEI
44 DATA F3,E8,ØF,F3,EØ,ØØ,Ø7,FØ'BXCJ
45 DATA 1F,BF,F8,2Ø,BF,F8,3F,3E'BXPK
46 DATA FC,ØØ,7C,FE,Ø3,F8,FF,FF'BXHL
47 DATA FØ,FF,FF,CØ,FF,FF,ØØ,ØØ'BXSM
48 REM <E>'BDCJ
49 DATA 7F,FF,FE,FF,FF,FF,FF,FF'BXHP
5Ø DATA FF,FF,FF,FF,FE,7Ø,3E,F8'BXGG
51 DATA 6Ø,ØØ,CØ,A8,ØØ,F8,A8,ØØ'BXGH
52 DATA FC,6Ø,ØØ,FF,FF,CØ,FF,CF'BXPI
53 DATA FØ,FF,9F,F8,FF,9F,F8,FF'BXCJ
54 DATA 8Ø,ØØ,FF,8Ø,ØØ,EF,CØ,ØØ'BXXK
55 DATA EF,EØ,Ø3,F3,FF,Ø7,FC,ØØ'BXKL
56 DATA FF,FF,FF,FF,7F,FF,FE,ØØ'BXSM
57 REM <F>'BDDJ
58 DATA 7F,FF,FE,FF,FF,FF,FF,FF'BXHP
59 DATA FF,FF,FF,FF,FE,7Ø,3E,F8'BXGP
6Ø DATA 6Ø,ØØ,CØ,A8,ØØ,F8,A8,ØØ'BXGH
61 DATA FC,6Ø,ØØ,FF,FF,CØ,FF,CF'BXPI
62 DATA FØ,FF,9F,F8,FF,9F,F8,FF'BXCJ
63 DATA 8Ø,ØØ,FF,8Ø,ØØ,FF,8Ø,ØØ'BXNK
64 DATA FC,ØØ,ØØ,F3,8Ø,ØØ,FF,8Ø'BXCL
65 DATA ØØ,FF,8Ø,ØØ,7F,8Ø,ØØ,ØØ'BXQM
66 REM <G>'BDEJ
67 DATA Ø3,FF,8Ø,1F,FF,FØ,3F,E1'BXRO
68 DATA C8,7F,D8,ØC,7F,FC,9E,E7'BXHP
69 DATA FF,FE,DB,E1,FF,DF,8Ø,55'BXCQ
7Ø DATA DB,ØØ,ØØ,C6,ØØ,ØØ,FE,ØØ'BXHI
71 DATA ØØ,FE,Ø5,54,FE,Ø7,FE,FE'BXTJ
72 DATA Ø7,FF,FF,ØØ,7F,FF,81,FF'BXWK
73 DATA 7F,FF,FE,7F,FF,FE,3F,FF'BXCL
74 DATA F8,1F,FF,FØ,Ø7,FF,CØ,ØØ'BXPM
75 REM <H>'BDFJ
76 DATA 1E,ØØ,3E,3F,ØØ,3F,3F,ØØ'BXWO
77 DATA 7F,3F,8Ø,7F,7F,8Ø,FE,7F'BXBP
78 DATA 8Ø,FE,7F,ØØ,FE,3F,ØØ,FC'BXPQ
79 DATA 3F,77,FC,3F,8Ø,FC,1F,FF'BXWR
8Ø DATA FC,1F,E4,FC,1F,FF,FE,1F'BXOJ
81 DATA ØØ,3E,3F,2Ø,9E,3F,18,BE'BXFK
82 DATA 3F,Ø7,3E,7F,ØØ,7E,7F,ØØ'BXSL
83 DATA 7C,7F,ØØ,FC,FE,ØØ,FC,ØØ'BXGM
```

END

Program 3

```
1Ø FOR T=3584 TO 4Ø95:READ A$
   :A=DEC(A$):POKE T,A:NEXT'IXXG
11 BSAVE"SP.I-P",BØ,P3584 TO
   P4Ø96'CPUE
12 REM <I>'BDGA
13 DATA ØF,FF,8Ø,1F,FF,CØ,1F,FF'BXDF
14 DATA CØ,1F,FF,CØ,ØE,EE,8Ø,Ø1'BXDG
15 DATA BA,ØØ,Ø1,FE,ØØ,Ø1,FE,ØØ'BXYH
16 DATA ØØ,24,ØØ,ØØ,24,ØØ,Ø1,FE'BXNH
17 DATA ØØ,Ø3,EE,ØØ,Ø3,EØ,ØØ,Ø3'BXEI
18 DATA 78,ØØ,Ø3,B8,ØØ,Ø3,CØ,ØØ'BXXJ
19 DATA Ø7,FE,ØØ,ØD,FF,ØØ,ØE,FF'BXFL
2Ø DATA ØØ,1F,7F,ØØ,1F,9E,ØØ,ØØ'BXGD
21 REM <J>'BDHA
22 DATA ØØ,ØØ,3F,ØØ,ØØ,FF,ØØ,Ø1'BXCE
23 DATA FF,ØØ,ØØ,FF,ØØ,Ø4,ØF,ØØ'BXPG
24 DATA ØB,BF,ØØ,ØA,87,ØØ,ØA,BF'BXXH
25 DATA ØØ,ØE,BF,ØØ,Ø3,3F,ØØ,ØØ'BXQI
26 DATA 7F,ØØ,Ø3,FF,ØØ,Ø7,E7,ØØ'BXMJ
27 DATA Ø7,C7,7C,Ø3,8F,FF,ØØ,1E'BXJK
28 DATA FF,CØ,3E,7F,FØ,7C,3F,FF'BXJL
29 DATA FC,Ø7,FF,F8,ØØ,FF,EØ,ØØ'BXNM
3Ø REM <K>'BDIA
31 DATA FC,ØØ,7E,FE,Ø1,CE,7E,Ø7'BXOF
32 DATA 9C,7F,ØF,BA,7F,1C,F4,7F'BXTG
33 DATA 39,E8,3F,7B,DØ,3E,FF,AØ'BXWH
34 DATA 3D,FF,4Ø,3F,FE,8Ø,3F,FC'BXOI
35 DATA ØØ,3F,FE,8Ø,3D,FF,4Ø,3E'BXWJ
36 DATA FF,AØ,7F,7F,DØ,7F,1F,E8'BXVK
37 DATA 7F,ØF,F4,7F,Ø7,FA,ØØ,Ø3'BXGL
38 DATA FC,E7,ØØ,FE,E7,ØØ,3C,ØØ'BXNM
39 REM <L>'BDJJ
4Ø DATA C9,8Ø,ØØ,6B,ØØ,ØØ,6B,ØØ'BXLF
41 DATA ØØ,7F,ØØ,ØØ,7F,ØØ,ØØ,ØØ'BXPF
42 DATA ØØ,ØØ,7F,ØØ,ØØ,7F,8Ø,ØØ'BXXG
43 DATA 7F,8Ø,ØØ,7E,6Ø,ØØ,7C,BØ'BXQI
44 DATA ØØ,79,8Ø,ØØ,7F,CØ,ØØ,7F'BXCJ
45 DATA EØ,ØØ,7F,8Ø,ØØ,77,8Ø,ØØ'BXHK
46 DATA 7B,CØ,ØØ,7C,ØØ,3Ø,7F,FF'BXWL
47 DATA FØ,7F,FF,FØ,3F,FF,EØ,ØØ'BXIM
48 REM <M>'BDKJ
49 DATA FE,ØØ,7F,FE,ØØ,7F,FF,ØØ'BXOO
5Ø DATA FF,FF,ØØ,FF,FF,81,FF,FC'BXVG
51 DATA 81,3F,FF,C3,FF,FF,C3,FF'BXFH
52 DATA FF,E7,FF,FF,E7,FF,FF,FF'BXVI
```

```
53 DATA FF,FF,FF,FF,FF,FF,FF,FF,EF'BXWK
54 DATA FF,FB,F7,FF,F7,FB,FF,EF'BXOK
55 DATA FC,FF,9F,FE,3E,3F,FE,ØØ'BXCL
56 DATA 3F,FE,ØØ,3F,FE,ØØ,3F,ØØ'BXMM
57 REM <N>'BDLJ
58 DATA 1F,ØØ,FC,7F,81,F6,77,C1'BXPO
59 DATA E2,EF,C1,CA,EF,E1,A2,F7'BXLP
6Ø DATA E1,F4,F7,F1,BC,FB,F1,9C'BXEH
61 DATA FB,F9,8Ø,FD,E9,CØ,FD,DD'BXDI
62 DATA E4,FC,FD,FC,FC,FE,F8,FC'BXFJ
63 DATA 7E,F8,FC,7F,78,FC,3F,78'BXAK
64 DATA 3Ø,3F,AØ,F8,1F,FØ,F8,ØE'BXWL
65 DATA FØ,FE,Ø2,FC,FF,ØØ,FE,ØØ'BXVM
66 REM <O>'BDMJ
67 DATA Ø1,FE,ØØ,ØF,FF,CØ,1F,FE'BXVO
68 DATA 7Ø,1F,9Ø,F8,3F,3F,F8,3C'BXWP
69 DATA 6Ø,7C,7F,8Ø,1C,7F,ØØ,ØE'BXPQ
7Ø DATA 7E,Ø2,Ø6,7E,62,Ø6,7C,F3'BXFI
71 DATA C6,7C,92,46,7C,F2,46,7C'BXJJ
72 DATA 9Ø,ØE,3E,ØØ,1E,3F,ØØ,7C'BXDK
73 DATA 3F,C1,FC,1F,FF,F8,ØF,FF'BXAL
74 DATA FØ,Ø7,FF,EØ,Ø1,FF,8Ø,ØØ'BXXM
75 REM <P>'BDNJ
76 DATA 5F,FF,FØ,EF,BF,FC,3F,DF'BXKO
77 DATA EE,FF,9F,EF,3F,5F,FF,FE'BXAP
78 DATA 1F,FF,7D,FF,FF,FF,FF,FF'BXPQ
79 DATA 7F,FE,7E,FF,FF,ØØ,7F,FF'BXMR
8Ø DATA F8,FF,FF,FØ,7F,ØØ,ØØ,FF'BXOJ
81 DATA 8Ø,ØØ,7F,8Ø,ØØ,FF,8Ø,ØØ'BXYK
82 DATA 7F,8Ø,ØØ,FF,ØØ,ØØ,7F,ØØ'BXLL
83 DATA ØØ,FF,CØ,ØØ,FF,CØ,ØØ,ØØ'BXCM
```

END

Program 4

```
1Ø FOR T=3584 TO 4Ø95:READ A$
   :A=DEC(A$):POKE T,A:NEXT'IXXG
11 BSAVE"SP.Q-X",BØ,P3584 TO
   P4Ø96'CPLE
12 REM <Q>'BDOA
13 DATA Ø1,FE,ØØ,ØF,FF,CØ,1E,38'BXNF
14 DATA FØ,1C,92,78,3C,38,FC,3F'BXSG
15 DATA FF,FC,7F,CØ,7E,7F,ØØ,ØE'BXMH
16 DATA 7E,ØØ,Ø7,7E,ØØ,Ø7,7C,ØØ'BXXI
17 DATA Ø7,7C,ØØ,Ø7,7C,ØØ,Ø7,7C'BXAJ
18 DATA ØØ,EF,3E,Ø7,EE,3F,1F,F6'BXSK
19 DATA 3F,CØ,F8,1F,FE,FC,ØF,FF'BXXL
2Ø DATA 7B,Ø7,FE,3F,Ø3,F8,1E,ØØ'BXGD
21 REM <R>'BDPA
22 DATA Ø1,FF,EØ,ØF,FF,F8,3F,FF'BXHF
23 DATA FC,7F,FF,FE,FF,FF,FF,FF'BXEH
24 DATA FF,FF,FF,E1,FF,FF,8Ø,FF'BXUH
25 DATA FF,C6,FE,FF,F1,FC,FF,FF'BXJI
26 DATA F8,FC,FE,FØ,FC,3F,CØ,FC'BXNJ
27 DATA 1D,8Ø,FC,ØE,CØ,FC,Ø7,6Ø'BXPK
28 DATA FC,Ø3,BØ,FC,Ø1,D8,FC,ØØ'BXYL
29 DATA EC,FC,ØØ,74,FC,ØØ,38,ØØ'BXUM
3Ø REM <S>'BDQA
31 DATA ØØ,3F,F8,Ø7,FF,FE,3F,FF'BXTF
32 DATA FF,7F,FF,FF,7F,Ø7,33,FC'BXUG
33 DATA Ø3,FF,F8,Ø1,FE,F8,ØØ,7C'BXDH
34 DATA FC,ØØ,ØØ,FE,ØØ,ØØ,7F,8Ø'BXWI
35 DATA ØØ,7F,F8,ØØ,3F,FF,8Ø,Ø7'BXTJ
```

MOBSTERS

```
36 DATA FF,F8,00,3F,FE,C0,07,FF'BXNK
37 DATA F8,03,FF,7F,01,FF,1F,FE'BXSL
38 DATA FE,07,FF,FC,00,7F,F0,00'BXMM
39 REM <T>'BDRJ
40 DATA 00,07,F8,01,FF,E0,7F,FF'BXCF
41 DATA 3F,FF,F3,FF,FF,FF,FF,FF'BXPG
42 DATA 7F,FF,FE,7F,E0,F8,7F,FF'BXUH
43 DATA E0,7F,54,00,7E,00,00,7E'BXQI
44 DATA 00,00,7E,00,00,7E,00,00'BXNI
45 DATA 7E,00,00,7E,00,00,7E,00'BXLK
46 DATA 00,7E,00,00,7E,00,00,7E'BXLL
47 DATA 00,00,7E,00,00,7E,00,00'BXNL
48 REM <U>'BDSJ
49 DATA 70,00,3F,7C,00,7E,7E,00'BXPO
50 DATA FE,7E,00,FC,7F,01,FC,3F'BXJG
51 DATA 01,FC,3F,01,FC,3F,01,FC'BXCH
52 DATA 1F,00,F8,1F,00,F8,1F,00'BXFI
53 DATA F8,1F,00,FC,3F,00,FC,3F'BXLJ
54 DATA 66,FC,3F,00,FC,7F,FB,FE'BXHK
55 DATA 7F,FD,FE,7F,E1,FE,7E,FF'BXGL
56 DATA BE,7F,00,7E,1F,FF,F8,00'BXTM
57 REM <V>'BDTJ
58 DATA 78,00,00,7E,00,5E,67,00'BXJO
59 DATA EF,33,00,F7,1B,81,DB,1B'BXOP
60 DATA 81,DA,09,C3,90,0D,C3,30'BXHH
61 DATA 0C,C3,70,06,C6,60,06,E6'BXTI
62 DATA E0,07,66,E0,03,F3,C0,03'BXMJ
63 DATA FF,C0,03,FF,C0,03,E6,40'BXOK
64 DATA 03,FF,C0,1D,FD,DE,00,F0'BXSL
65 DATA 80,0F,7F,3C,00,7E,00,00'BXKM
66 REM <W>'BDUJ
67 DATA FC,00,3F,FE,00,7F,F8,00'BXTO
68 DATA 1F,FE,00,7F,FC,00,3F,7E'BXPP
69 DATA 00,7E,7E,00,7E,78,00,1E'BXWQ
70 DATA 77,81,EE,7C,00,3E,3D,99'BXHI
71 DATA BC,3C,3C,3C,3F,81,FC,3F'BXEJ
72 DATA 7E,FC,3E,FF,7C,3E,FF,7C'BXIK
73 DATA 1F,FF,F8,1F,C3,F8,1F,81'BXFL
74 DATA F8,1F,00,F8,0E,00,70,00'BXMM
75 REM <X>'BDVJ
76 DATA FF,00,FF,3E,00,7C,1E,66'BXXO
77 DATA 78,1E,00,78,1F,00,F8,0F'BXDP
78 DATA BD,F0,0F,C3,F0,07,E7,E0'BXIQ
79 DATA 07,FF,E0,03,C3,C0,01,3C'BXPR
80 DATA 80,00,FF,00,01,FF,80,03'BXJJ
81 DATA FF,C0,07,E7,E0,0F,E7,F0'BXRK
82 DATA 1F,C3,F8,1F,C3,F8,3F,81'BXKL
83 DATA FC,3F,81,FC,7F,00,FE,00'BXOM
```

END

Program 5

```
10 FOR T=3584 TO 3839:READ A$
   :A=DEC(A$):POKE T,A:NEXT'IXDG
12 BSAVE"SP.Y-Z",B0,P3584 TO
   P4096'CPVF
14 REM <Y>'BDWC
16 DATA 3C,00,1F,7C,00,7F,7E,00'BXEI
18 DATA FE,7E,01,FC,3F,03,FC,3F'BXIK
20 DATA 9B,F8,1F,7E,F0,1F,FF,E0'BXTD
22 DATA 0F,FF,C0,07,FF,80,03,80'BXGF
24 DATA 00,00,1B,00,00,40,00,00'BXFG
26 DATA 7F,00,00,73,80,00,77,80'BXBI
```

```
28 DATA 00,70,00,00,7F,00,00,70'BXAK
30 DATA 00,00,7E,00,00,7E,00,00'BXND
32 REM <Z>'BDXC
34 DATA 3F,FF,FC,FC,00,3F,FF,99'BXOI
36 DATA FF,F7,FF,DF,F3,FF,9F,38'BXVK
38 DATA FE,3F,04,00,7E,03,FF,FE'BXQM
40 DATA 00,03,FC,00,07,F8,00,0F'BXEF
42 DATA F0,00,3F,E0,00,FF,C0,03'BXKH
44 DATA FF,80,0F,FF,00,3F,FE,00'BXMJ
46 DATA 7F,FC,FE,FF,FD,FF,FF,FE'BXBM
48 DATA 7F,7F,FF,FF,0F,FF,FF,00'BXHN
50 REM <.>'BDEC
52 DATA 00,00,00,00,00,00,00,00'BXHH
54 DATA 00,00,00,00,00,00,00,00'BXHJ
56 DATA 00,00,00,00,00,00,00,00'BXHL
58 DATA 00,00,00,00,00,00,00,00'BXHN
60 DATA 00,00,00,00,00,00,00,00'BXHG
62 DATA 00,00,00,3E,00,01,FF,80'BXEJ
64 DATA 03,C9,C0,03,FF,E0,03,FF'BXQL
66 DATA E0,03,81,C0,01,FF,00,00'BXYN
68 REM <?>'BDVL
70 DATA 00,3F,00,00,FF,C0,03,FF'BXLI
72 DATA F0,07,C0,18,0E,79,98,0C'BXGK
74 DATA F9,98,0E,7F,F0,07,03,C0'BXAM
76 DATA 03,F3,80,01,C7,00,00,0E'BXLO
78 DATA 00,00,3C,00,00,78,00,00'BXTP
80 DATA F0,00,00,E0,00,00,E0,00'BXVI
82 DATA 00,00,00,00,E0,00,03,F0'BXDK
84 DATA 00,03,F0,00,01,C0,00,00'BXCM
```

END

Program 6 Commodore 64 Only

```
1 REM PLACE THESE LINES AT THE TOP OF
  PROGRAMS 2-5, SAVE, THEN RUN'BYSN
2 FOR T=12288 TO 12543:READ A$
  :REM CHANGE 12798 TO 12543 FOR
  PROGRAM 5'FTON
3 LE$=LEFT$(A$,1):RI$=RIGHT$(A$,
  1)'ETAH
4 LE=ASC(LE$)-48:IF LE>16 THEN
  LE=LE-7'ITPL
5 RI=ASC(RI$)-48:IF RI>16 THEN
  RI=RI-7'ITJN
6 LE=LE*16:NU=LE+RI'ENAK
7 POKE T,NU:NEXT'CFRH
8 END'BACG
```

END

Program 7 Commodore 64 Only

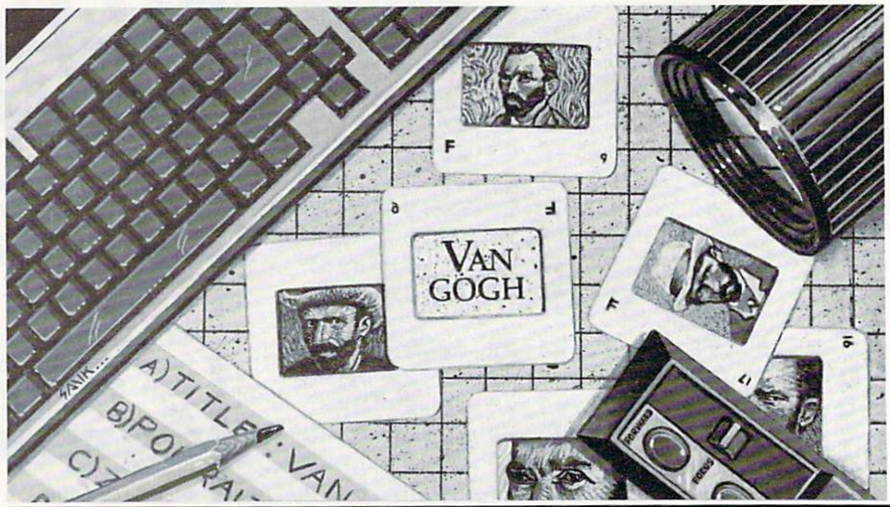
```
1 REM RUN PROGRAMS 2 - 5,
   THEN RUN THIS'BBLH
2 V=53248:POKE 53280,0:POKE 53281,0
  :FOR T=0 TO 7'GBGJ
3 POKE 2040+T,192+T:POKE V+T*2,T*30+24
  :POKE V+39+T,T+1:POKE V+T*2+1,200
  :NEXT'RNBU
4 POKE V+21,255'CHSE
5 PRINT"[CLEAR,DOWN,SPACE8]
  WE LIKE TO WIGGLE"'BAGJ
6 X=-1:Y=1'DFQH
7 FOR T=0 TO 3:POKE V+T*4,
  PEEK(V+T*4)+X:POKE V+T*4+2,
  PEEK(V+T*4+2)+Y:NEXT'UDVY
8 X=-X:Y=-Y:GOTO 7'FHEL
```

END

BY MICHAEL J. KERYAN

Show Anything Slide Show

for the Commodore 64



These programs are all you need to set up your own slide show using your Commodore 64.

Recently I was asked to put together a computer graphics slide show for a local Commodore user's group. The slide show was intended to illustrate a number of uses of the Commodore 64, including art-oriented graphics as well as business graphics. "No problem—this should take about 20 minutes," I thought. But when I started looking through my disks full of programs, I found it would not be quite so simple.

I already had a number of slideshow programs. The problem was that each one showed only one type of graphic format. The nicest of these programs showed artists' renditions. They were all in a modified *KoalaPainter* format. Unfortunately, I found that this program was not totally compatible with standard Koala pictures, and some colors changed from white to black.

Another nice slideshow program showed nothing but *Doodle!* format pictures. The *Flying Colors* disk contained a good slideshow program, but you guessed it: It only works with pictures made from *Flying Colors*.

So I decided to write a slideshow program to incorporate the best features of programs I've seen to work with any graphic file. While I was at it, I wrote another program to design and save alpha-style title slides. The programs included in this article are everything you need to set up your own slide show. The formats supported are

1. *KoalaPainter*—multicolor mode
2. *Doodle!*—high-resolution mode
3. *Flying Colors*—multicolor mode
4. *ULTRABASIC-64*—multicolor and high-resolution modes
5. *HES GRAPHICS BASIC*—multicolor and high-resolution modes
6. *CADPAK 64*—high-resolution mode
7. *TWO COLOR*—(TPUG, *PRINT SHOP, FLEXIDRAW, COMPUTER-EYES*)—high-resolution mode
8. *Title*—alpha mode
9. *B/Graph*—high-resolution mode

The *Two-Color* format supports any graphic in a 32-block PRG file. This is by far the most common mode used for high-resolution drawings. These pictures are normally shown in black and white, but any two colors can be used. The other formats are self-explanatory. If you have any graphics in these formats, they will work with the Show Anything Slide Show.

Four separate BASIC programs are required to get your slide show up and running. Each are described separately.

Slideshow Maker (Listing 1)

This program does what you manually do when you set up a slide show for your projector. First, you decide what slides will be included in the slow. Then you decide on the order for each. For presentations, you might write a little script and decide how long each slide will be shown.

This program creates a small sequential file called Set-up that will automate your slide show. You can start from scratch with this program, or you can use the program to edit or change an existing Set-up for a new or revised show.

The first thing the program does is request the names and types of formats for all the slides you want to include. The order here is not necessarily the same as that in which the slides will be shown. Just be sure to include all the desired slides and spell their names correctly. With *Koala* pictures, don't include the leading reverse-field character in the name; start the name with PIC.... In addition, you can leave out the leading DD characters for *Doodle!* pictures; the program will add them for you. You won't get any help with the other formats. Just be sure to spell their names as shown in the directory.

For graphics in the 32-block format (*The Print Shop* for example), you will be prompted for the foreground and background colors. You can choose black and white or any other pleasing combination.

Next you will set up the order for the slides. Note that you can use any of the slides included above any number of times, or not at all. You may want to use the same Title slide, displaying a logo or message in between each of the other slides, for instance. For each slide sequence, you will be asked to provide three additional attributes.

1. *Time Displayed*—Enter the number of seconds you want the slide to be displayed before the next slide is loaded.
2. *Auto or Wait*—After the time period above, the next slide will be automatically loaded and displayed if you choose Auto. If you choose Wait, the slide show will wait until you press a key on the keyboard before going on.
3. *Fast or Fade*—Fast provides instantaneous transition between the display of

two slides. Fade simulates a fade-to-black of the current slide before the next slide is displayed.

After you're done, you will be asked if you want to review your set-up. It's a good idea to step through everything again to check it. You will be given a chance to change anything you would like by typing over it, or if all is correct, just keep hitting the RETURN key. When everything checks out, place a formatted disk in the drive to save the Set-up file.

Make Slide (Listing 2)

This program merely creates a machine-language program that is used by the slideshow program. Just load and run it. If you don't have any errors in your DATA statements, the machine-language file will be created and saved to a formatted disk. Make sure this program goes on the same disk as your slide show. This program contains routines for loading and displaying the various graphic formats. By making extensive use of machine-language routines, the Show Slides program (Listing 4) runs faster.

Title Creator (Listing 3)

You can make title slides with nearly any graphic program. So why use another new format? Title Creator creates a colored title slide in a nine-block file, not 32 or 37 or 40 blocks. That means you can get many more onto a disk, and they will load about three times faster than the larger graphic files. Although designed primarily for alpha-numeric titles, you can use this format to piece together the graphic symbols you get when using the SHIFT or COMMODORE keys to make low-resolution graphic images.

The Title Creator program, although written entirely in BASIC, is fairly sophisticated. One feature is a message/help/status line that scrolls across the bottom of the screen. With this program, you will use the cursor keys to position the cursor, and the other keys to place graphic symbols or letters on the screen. The function keys are used for special features. All keys repeat, making it easy to draw repeating patterns and grids.

Cursor Positioning does not normally change anything on the screen, it moves only the cursor. Cursor Keys move the cursor up, down, left and right. The cursor will not move past the four boundaries.

The home key moves the cursor to the upper-left corner. The Shift RETURN key moves the cursor to the bottom-right corner.

The delete key deletes the character or symbol under the cursor without changing the position of any other characters on the same line. The CLEAR key/SHIFT HOME clears the display. Before your screen is wiped out, you will be given a prompt to make sure this is really what you want to do.

Control U changes the screen to upper-case/graphic symbols. Control L changes the screen to lower case/upper case. Control H generates a help message at the bottom of the screen.

Press the Commodore key or CTRL key along with the numbers 1 through 9 to change the character color. Only those characters you type after the change will be in the new color.

F1 selects a new cursor character. You will be prompted to press a key that will become the new cursor symbol. This is useful when used in conjunction with F3 or F7. F2 changes the border color. Keep pressing F2 until you get the color you like.

F3 toggles draw mode on/off. When draw mode is on, moving the cursor will draw a line of cursor symbols in the direction you are moving. Remember, the cursor can be any character or graphic symbol defined by F1. Press F3 again to kill the draw mode. F4 changes the background color.

F5 toggles reverse mode on/off. When reverse mode is on, any character typed or drawn will be left in a reverse field. In addition, move the cursor over text or symbols while in the reverse mode, and the text or symbols will be changed to reverse field characters or symbols. Press F5 again to turn off the reverse mode. To get a solid block, use a reverse space.

F6 loads a new screen from disk. This will destroy the screen currently being displayed. F7 prints the cursor. Here, instead of typing a character, F7 will print the cursor character to the screen. This is useful in drawing line segments. And F8 saves the current screen to disk. Save your screens before loading new ones.

The easiest way to make up a series of similar title slides is by making changes to an existing slide by typing over the text and saving the revisions. You don't have to start from scratch on each one.

Show Slides (Listing 4)

This is the actual slideshow program. Make sure this program, the Make Slide program, the Set-up file, and all the slides for the slide show are all copied onto the same disk. Then merely load and run Show Slides for an automated slide show.

Although the Set-up contains information on how long each slide will be displayed and whether to wait for keyboard entry to go to the next slide, you can override these defaults when running the slide show.

If you press the F1 key while a slide is being displayed, you will enter the Pause mode. While pausing, you will hear an audio prompt (bell sound) to remind you the computer is waiting. Press any other key to load the next picture.

If you press the left-arrow key (in the upper-left corner of the keyboard), the previous slide will be redisplayed next. Use this feature if you just remembered what you were supposed to say about the last picture.

If you press the Q key (for Quit), the program will end abruptly. Press Q only if you've managed to put everyone in your audience to sleep prematurely.

If you press any other key (other than F1, left arrow, or Q keys), the next slide will be loaded immediately. The fire button on a joystick plugged into port one will also load in the next picture. Use the joystick as a remote switch for presentations.

After the last slide, the sequence will automatically restart from the beginning. This allows you to use the slide show for a completely automatic attention-getter that runs by itself all day, or at least until your 1541 drive fails. A good idea for the last slide is a title that merely says "Press <Q> key to quit, <C> key to continue." This slide will naturally have a wait attribute.

The Show Slides program runs well with Epyx's *Fast Load* cartridge which loads most slides in seven seconds or less. Remember, the loading times are in addition to the display times you set up. Without *Fast Load*, most pictures take about 30 seconds to load. The other non-cartridge 1541 speed-up programs may or may not work. A potential problem is that some graphic formats may load into the same memory locations used by the software speed-up program.

Once you become familiar with the Show Anything Slide Show, you will find it quite helpful at users' groups, seminars and even business presentations at your office.

Continued on pg. 96

64 USERS ONLY/SHOW ANYTHING SLIDE SHOW

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007, 1-800-831-2694.

Listing 1 Slideshow Maker

```
100 DIM NA$(5Ø),TY(5Ø),CO(5Ø)'BVQY
110 DIM SN(5Ø),SC(5Ø),KP$(5Ø),
    TR$(5Ø)'BELC
120 POKE 5328Ø,6:POKE 53281,1
    :POKE 646,Ø'DVXC
130 PRINT"[CLEAR,DOWN2,SPACE2]
    THIS PROGRAM WILL HELP YOU SET UP
    A"'BALJ
140 PRINT"[SPACE2]SLIDESHOW.[SPACE2]
    A SEQUENTIAL FILE NAMED"'BAFJ
150 PRINT"[SPACE2]'SET-UP' WILL BE
    CREATED.":PRINT'CBTI
160 PRINT"[SPACE2]THE 'SET-UP' FILE
    WILL BE USED BY THE"'BAEL
170 PRINT"[SPACE2]PROGRAM 'SHOW
    SLIDES'.":PRINT'CBCJ
180 PRINT"[SPACE2]NOW, PUT IN A DISK
    THAT YOU WILL WANT"'BACN
190 PRINT"[SPACE2]THIS SLIDSHOW ON,
     OR PUT IN A DISK"'BAWN
200 PRINT"[SPACE2]WITH A FILE YOU
    WANT TO CHANGE, AND"'BAPF
210 PRINT"[SPACE2]PRESS THE RETURN
    KEY.":PRINT'CBFE
220 DIM CO$(15)'BHRY
230 FOR I=Ø TO 15: READ CO$(I)
    :NEXT I'FNDE
240 DATA "BLACK","WHITE","RED","CYAN"
    "PURPLE","GREEN"'BFRJ
245 DATA "BLUE","YELLOW","ORANGE",
    "BROWN","LT RED","DARK GRAY"'BFQQ
250 DATA "MED GRAY","LT GREEN",
    "LT BLUE","LT GRAY"'BDKK
260 DIM TN$(9)'BGND
270 FOR I=Ø TO 9: READ TN$(I)
    :NEXT I'FMYI
280 DATA "END","KOALAPAINTER",
    "DOODLE","FLYING COLORS",
    "ULTRABASIC-64"'BEPS
290 DATA "HES GRAPHICS","CADPAK-64",
    "2 COLOR (32 BLKS)","TITLE",
    "B/GRAPH"'BEST
300 GOSUB 1Ø6Ø:GOSUB 113Ø
    :IF E1>Ø THEN 3ØØ'FQDD
310 IP=Ø:IS=Ø:PRINT"[CLEAR,DOWN2,
    SPACE2]FIRST, WE'LL HAVE TO MAKE
    A LIST OF"'DIDL
320 PRINT"[SPACE2]ALL THE GRAPHIC
    FILES TO BE INCLUDED"'BAIJ
330 PRINT"[SPACE2]IN THE SLIDESHOW.
    [SPACE2]I'LL TAKE THEM"'BACJ
340 PRINT"[SPACE2]ONE AT A TIME."
    :PRINT'CBSG
350 PRINT"[SPACE2]HERE ARE THE SLIDE
    TYPES:":PRINT'CBSK
360 IP=IP+1:PRINT"[SPACE2]
    PICTURE FILE #";"[RVS]";IP;"
    [RVOFF]":PRINT'EMMN
370 FOR I=1 TO 9:PRINT"[SPACE3]
    "TN$(I);TAB(22);I:NEXT I'GSRM
380 PRINT"[SPACE3]"TN$(Ø);TAB(22);
    Ø'CMWJ
390 PRINT:PRINT"[SPACE9]
    WHICH NUMBER ";TY(IP)
    :PRINT"[UP]"TAB(21);'ENEQ
400 GOSUB 138Ø:INPUT A'CGNA
410 IF A<Ø OR A>9 THEN 39Ø'FHED
420 IF A=Ø THEN N$="END":GOTO 56Ø'FIBF
430 PRINT:PRINT"[SPACE3]
    NOW ENTER THE NAME[SPACE2]";
    NA$(IP):POKE 646,Ø'DPWL
440 GOSUB 138Ø:INPUT"[UP,RIGHT21]";
    N$'CIIH
450 IF LEN(N$)<1 THEN 43Ø'EIAH
460 IF A>2 THEN 56Ø'DFPG
470 IF A>1 THEN 54Ø'DFMH
480 IF LEFT$(N$,1)=CHR$(129)THEN
    52Ø'FOXM
490 IF LEN(N$)<14 THEN N$=N$+" "
    :GOTO 49Ø'HOSO
500 IF LEN(N$)>14 THEN N$=LEFT$(N$,
    14)'GPOG
510 N$=CHR$(129)+N$:GOTO 56Ø'ENGF
520 IF LEN(N$)<15 THEN N$=N$+" "
    :GOTO 52Ø'HONI
530 IF LEN(N$)>15 THEN N$=LEFT$(N$,
    15)'GPQJ
540 IF LEFT$(N$,2)<>"DD"THEN
    N$="DD"+N$'HKKK
550 IF RIGHT$(N$,1)=" "THEN LN=LEN(N$)
    :N$=LEFT$(N$,LN-1):GOTO 55Ø'KCQQ
560 IF A<>7 THEN CO(IP)=Ø
    :GOTO 67Ø'GNDL
570 PRINT"[CLEAR,DOWN2,SPACE2]
    WITH A BLACK/WHITE PICTURE,
     WE"'BAAP
580 PRINT"[SPACE2]CAN ACTUALLY USE
    ANY TWO COLORS."'BAWQ
590 PRINT"[SPACE2]THESE ARE THE COLOR
    CODES:":PRINT'CBEQ
600 FOR I=Ø TO 7:PRINT"[SPACE4]"I;
    TAB(7);CO$(I);TAB(22);I+8;TAB(26);
    CO$(I+8)'JJCN
605 NEXT I:PRINT'CCHG
610 C1=INT(CO(IP)/16):C2=CO(IP)
    -16*C1'GACK
620 PRINT"[SPACE3]FOREGROUND COLOR
    [SPACE3]"C1:PRINT"[UP]"TAB(21);
    :GOSUB 138Ø:INPUT C1'FPLO
630 IF C1<Ø OR C1>15 THEN 62Ø'FKQI
640 PRINT"[SPACE3]BACKGROUND COLOR
    [SPACE3]"C2:PRINT"[UP]"TAB(21);
    :GOSUB 138Ø:INPUT C2'FPQP
650 IF C2<Ø OR C2>15 OR C1=C2 THEN
    64Ø'HOUM
660 CO(IP)=C1*16+C2'DMLK
670 NA$(IP)=N$:TY(IP)=A
    :IF A>Ø THEN PRINT"[CLEAR,DOWN2]"
    :GOTO 36Ø'HYOR
680 PRINT"[CLEAR,DOWN2,SPACE2]NEXT,
     WE HAVE TO ARRANGE THE
```

64 USERS ONLY/SHOW ANYTHING SLIDE SHOW

```
    SLIDES"'BAWS
690 PRINT"[SPACE2]IN ORDER AND SET UP
    PARAMETERS FOR"'BAHT
700 PRINT"[SPACE2]EACH.[SPACE2]
    YOU HAVE A TOTAL OF"IP-1'CDTJ
710 PRINT"[SPACE2]FILES,
     WHICH CAN BE ARRANGED IN
    ANY"'BACL
720 PRINT"[SPACE2]ORDER.":PRINT'CBQG
730 NP=IP:IS=0:IF DL=0 THEN
    :FOR I=1 TO 4000:NEXT:DL=1'KYEQ
740 IS=IS+1:PRINT"[SPACE2]
    HERE ARE THE FILES:":PRINT'EHOO
750 FOR I=1 TO NP-1:PRINT"[SPACE2]"I;
    TAB(5);NA$(I);"[BLACK]";TAB(22);
    TN$(TY(I)):NEXT I'IKQT
760 PRINT"[SPACE2]"0;TAB(5);"END"'CFOK
770 PRINT:PRINT"[SPACE2]
    WHICH ONE "SN(IS):PRINT"[UP]
    "TAB(11);:GOSUB 1380:INPUT S'GTXT
780 IF S=0 THEN 930'DFDM
790 IF S<1 OR S>NP-1 THEN PRINT"[UP2]
    ";:GOTO 770'ILOS
800 TT=SC(IS):IF TT<1 THEN TT=60'FQXJ
810 PRINT:PRINT"[SPACE2]
    DISPLAY IT HOW MANY SECONDS "TT
    :PRINT"[UP]"TAB(29);'EIXP
820 GOSUB 1380:INPUT T'CGHG
830 IF T<0 OR T>3600 THEN PRINT"[UP2]
    ";:GOTO 810'HMIN
840 PRINT:PRINT"[SPACE2]
    NEXT SLIDE KEYED: [RVS]AUTO[RVOFF]
     OR [RVS]WAIT[RVOFF]"'CBAR
850 W$=KP$(IS):IF W$<>"AUTO"AND
    W$<>"WAIT"THEN W$="AUTO"'JQUU
860 PRINT"[SPACE4]"W$"[LEFT6]";
    :INPUT K$'CGBO
870 IF K$<>"AUTO"AND K$<>"WAIT"THEN
    PRINT"[UP3]";:GOTO 840'JJEU
880 PRINT:PRINT"[SPACE2]TRANSITION
    : [RVS]FADE[RVOFF] OR [RVS]FAST
    [RVOFF]"'CBRT
890 F$=TR$(IS):IF F$<>"FADE"AND
    F$<>"FAST"THEN F$="FAST"'JQEY
900 PRINT"[SPACE4]"F$"[LEFT6]";
    :GOSUB 1380:INPUT NF$'DMXL
910 IF NF$<>"FADE"AND NF$<>"FAST"THEN
    PRINT"[UP3]";:GOTO 880'JLAQ
920 SN(IS)=S:SC(IS)=T:KP$(IS)=K$
    :TR$(IS)=NF$:GOTO 740'FPWS
930 NS=IS:SN(NS)=0:SC(NS)=0
    :KP$(NS)="END ":TR$(NS)="END
    "'FLWU
940 PRINT"[DOWN2,SPACE2]
    DO YOU WANT TO REVIEW THIS? [RVS]
    Y[RVOFF] OR [RVS]N[RVOFF]"'BARS
950 GOSUB 1060:IF K$="N"THEN 980'EKIM
960 PRINT"[DOWN2,SPACE2]PRESS [RVS]
    RETURN[RVOFF] IF DATA IS OK."'BAHR
970 GOTO 310'BDDL
980 PRINT"[DOWN2,SPACE2]
    NOW PLACE INTO YOUR DISK DRIVE A
    DISK"'BAKV
990 PRINT"[SPACE2]TO HOLD THE NEW
    SLIDESHOW SET-UP AND"'BARW
1000 PRINT"[SPACE2]PRESS ANY
     KEY."'BABW
1010 GOSUB 1060'BEIU
1020 GOSUB 1250'BEJV
1030 PRINT"[DOWN2,SPACE2]
     YOUR FILE 'SET-UP' IS ALL SET
     UP."'BAHF
1040 STOP'BASW
1050 REM **** WAIT FOR KEY PRESS
     ****'BXME
1060 G=0:GET K$:IF K$<>""THEN
     1060'GMUF
1070 GET K$:G=G+1:IF G>100 THEN
     1100'GPCH
1080 IF K$=""THEN 1070'DGBE
1090 RETURN'BAQC
1100 GOSUB 1380'BENU
1110 G=0:GOTO 1070'CHEW
1120 REM **** GET SEQUENTIAL FILE
     ****'BARC
1130 CLOSE 15:OPEN 15,8,15'CKIA
1140 OPEN 2,8,2,"0:SET-UP,S,R"'BGOC
1150 INPUT#15,E1,E2$,E3,E4'BPFC
1160 IF E1>0 THEN PRINT"[SPACE2,RVS]
     "E2$"[RVOFF]":IF E1<>62 THEN
     1230'IPWJ
1170 IF E1=62 THEN E1=0:GOTO 1230'FMMG
1180 INPUT#2,Z$:NP=0:NS=0'DMOG
1190 A1$="":INPUT#2,A1$,A2$,A3$
     :IF A1$="END"OR A1$=""THEN
     1210'HDCN
1200 NP=NP+1:NA$(NP)=A1$
     :TY(NP)=VAL(A2$):CO(NP)=VAL(A3$)
     :GOTO 1190'IUCK
1210 A1$="":INPUT#2,A1$,A2$,A3$,A4$
     :IF A1$="END"OR A1$=""THEN
     1230'HHUH
1220 NS=NS+1:SN(NS)=VAL(A1$)
     :SC(NS)=VAL(A2$)'GEBI
1225 KP$(NS)=A3$:TR$(NS)=A4$
     :GOTO 1210'DBTJ
1230 CLOSE 2:RETURN'CCDY
1240 REM *** WRITE SEQUENTIAL
     FILE****'BBPG
1250 CLOSE 15:OPEN 15,8,15'CKID
1260 PRINT#15,"S0:SET-UP,S"'BDVF
1270 INPUT#15,E1,E2$,E3,E4'BPFF
1280 IF E1>1 THEN PRINT"[SPACE2,RVS]
     "E2$"[RVOFF]":GOTO 1360'FLWJ
1290 IF E1=62 THEN E1=0'EHAI
1300 OPEN 2,8,2,"0:SET-UP,S,W"'BGTA
1310 INPUT#15,E1,E2$,E3,E4'BPFA
1320 IF E1>0 THEN PRINT"[SPACE2,RVS]
     "E2$"[RVOFF]":IF E1<>62 THEN
     1360'IPAH
1330 PRINT#2,"SLIDESHOW SET-UP"'BCXE
1340 FOR I=1 TO NP:PRINT#2,NA$(I)",
     "TY(I)","CO(I):NEXT I'FALJ
1350 FOR I=1 TO NS:PRINT#2,SN(I)",
     "SC(I)","KP$(I)","TR$(I)
     :NEXT I'FGNL
```

Continued on pg. 100

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(EXAMPLES)
PROFESSIONAL SOFTWARE COMMODORE 64

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Leader Board	$39.95	$23.95	$22.95
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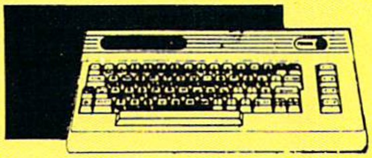
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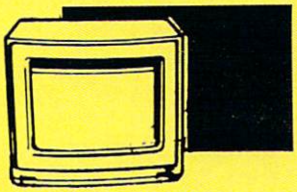
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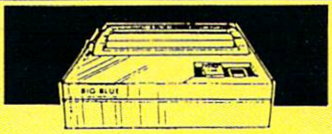
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This premium quality monitor comes with speaker and audio hook up, High Resolution, clear screen, 40 columns x 24 lines, front panel controls and more. Also be use with VCR. One year Ltd. warranty. (cable $9.95) List $329.00 **SALE $139.95**

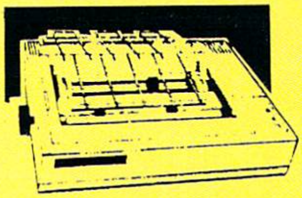
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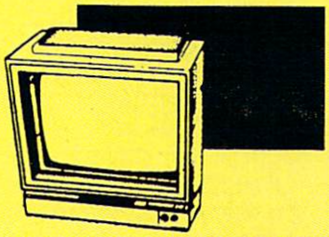
This is the affordable printer you have been waiting for! This 8½" letter size, 80 column dot matrix, heat transfer printer features upper and lower case, underline, graphics, word processing, and much more. List $199.00 **SALE $39.95**

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Must be used to get 80 columns in color with 80 column computers (C128 - IBM - Apple) (RGB cable $19.95) Add $14.50 shipping. List $399.00 **SALE $237.00**

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Continued from pg. 97

```
1360 CLOSE 2:RETURN'CCDD
1370 REM **** RING A BELL TONE
     *****'BWGI
1380 G=54272:POKE G+24,15
     :POKE G+1,110'FUDL
1385 POKE G+5,9:POKE G+6,9:POKE G+4,17
     :POKE G+4,16'IVUS
1390 RETURN'BAQF
```

END

Listing 2 Make Slide

```
10 POKE 56,80:POKE 644,80:CLR
   :PRINT"[CLEAR,DOWN2,SPACE3]
   READING DATA STATEMENTS........"'E
   OOL
20 ADDRESS = 20480: SUM = 0'CRXD
30 READ X: IF X<0 THEN CHECK =-X
   : GOTO 60'HNSG
40 POKE AD,X: AD = AD + 1'DKME
50 SUM = SUM + X: GOTO 30'DKUF
60 IF SUM<>CHECK THEN 170'ELDH
70 PRINT"[DOWN,SPACE3]PUT SLIDESHOW
   DISK IN DRIVE AND"'BAAM
80 PRINT"[SPACE3]PRESS A KEY."'BAOI
90 GET K$: IF K$<>"" THEN 90'FHIJ
100 GET K$: IF K$="" THEN 100'EIUY
110 OPEN 2,8,2," SLIDE.ML,P,W"'BGIB
120 PRINT#2,CHR$(0);CHR$(80);'DLBB
130 FOR I = 20480 TO 21451'DLBC
140 PRINT#2,CHR$(PEEK(I));'DIOC
150 NEXT I'BBCA
160 CLOSE 2: STOP'CCFC
170 PRINT"ERROR IN DATA.[SPACE2]
    CHECK DATA STATEMENTS."'BASM
180 STOP'BASD
20480 DATA 76, 62, 80, 76, 179, 80,
      76, 245, 80, 76'BGIE
20490 DATA 26, 81, 76, 92, 81, 76, 89,
      82, 76, 112'BFFF
20500 DATA 82, 76, 151, 82, 76, 61,
      83, 76, 97, 83'BFJD
20510 DATA 76, 62, 83, 76, 165, 82,
      76, 132, 83, 76'BGGE
20520 DATA 15, 82, 255, 0, 0, 0, 0, 0,
      0, 0'BXCD
20530 DATA 0, 0, 0, 0, 0, 0, 0, 0, 0,
      0'BTND
20540 DATA 0, 0, 169, 96, 32, 167, 80,
      169, 100, 141'BHAB
20550 DATA 148, 80, 169, 216, 32, 172,
      80, 173, 0, 104'BJUD
20560 DATA 141, 32, 208, 173, 1, 104,
      141, 33, 208, 173'BKDE
20570 DATA 2, 104, 141, 24, 208, 173,
      17, 208, 41, 223'BJFF
20580 DATA 9, 16, 141, 17, 208, 173,
      22, 208, 41, 207'BIVF
20590 DATA 141, 22, 208, 96, 120, 169,
      52, 133, 1, 96'BIBG
20600 DATA 169, 55, 133, 1, 88, 96,
      169, 224, 141, 148'BJRF
20610 DATA 80, 169, 32, 141, 151, 80,
      160, 32, 162, 0'BINF
20620 DATA 142, 147, 80, 142, 150, 80,
      189, 0, 224, 157'BKTB
20630 DATA 0, 32, 232, 208, 247, 238,
      148, 80, 238, 151'BKVC
20640 DATA 80, 136, 208, 238, 96, 169,
      132, 141, 148, 80'BLKD
20650 DATA 169, 4, 141, 151, 80, 160,
      4, 208, 215, 32'BIRD
20660 DATA 114, 80, 169, 160, 32, 128,
      80, 32, 120, 80'BJMF
20670 DATA 32, 165, 80, 169, 136, 141,
      148, 80, 169, 216'BLIG
20680 DATA 141, 151, 80, 32, 175, 80,
      173, 224, 131, 141'BLHH
20690 DATA 32, 208, 173, 225, 131,
      141, 33, 208, 32, 228'BLJI
20700 DATA 80, 173, 214, 131, 141, 22,
      208, 96, 173, 17'BKRA
20710 DATA 208, 9, 48, 141, 17, 208,
      173, 24, 208, 9'BHKA
20720 DATA 8, 141, 24, 208, 96, 169,
      96, 32, 128, 80'BHTB
20730 DATA 169, 92, 32, 167, 80, 32,
      228, 80, 32, 6'BGLC
20740 DATA 81, 96, 173, 22, 208, 41,
      207, 141, 22, 208'BJSE
20750 DATA 96, 173, 22, 208, 41, 223,
      9, 16, 141, 22'BHWE
20760 DATA 208, 96, 169, 96, 32, 128,
      80, 162, 0, 142'BINF
20770 DATA 150, 80, 160, 4, 140, 151,
      80, 169, 64, 141'BJMH
20780 DATA 147, 80, 169, 127, 141,
      148, 80, 32, 146, 80'BKEI
20790 DATA 162, 0, 142, 150, 80, 160,
      4, 169, 216, 141'BJHJ
20800 DATA 151, 80, 169, 40, 141, 147,
      80, 169, 131, 141'BLSB
20810 DATA 148, 80, 32, 146, 80, 173,
      16, 135, 141, 33'BJTC
20820 DATA 208, 32, 228, 80, 32, 15,
      81, 96, 169, 96'BHUC
20830 DATA 32, 128, 80, 160, 4, 140,
      111, 81, 162, 0'BHFD
20840 DATA 142, 110, 81, 165, 252,
      157, 0, 4, 232, 208'BJIF
20850 DATA 250, 238, 111, 81, 136,
      208, 244, 32, 228, 80'BLRG
20860 DATA 32, 6, 81, 96, 255, 0, 173,
      42, 80, 240'BFBG
20870 DATA 5, 169, 4, 32, 167, 81,
      169, 0, 141, 128'BGHH
20880 DATA 81, 169, 216, 32, 167, 81,
      173, 33, 208, 41'BJDJ
20890 DATA 15, 205, 43, 80, 208, 6,
      173, 44, 80, 141'BHVJ
20900 DATA 33, 208, 96, 141, 191, 81,
      141, 212, 81, 141'BKPC
20910 DATA 254, 81, 162, 0, 142, 190,
      81, 142, 211, 81'BJKD
20920 DATA 142, 253, 81, 160, 4, 189,
      0, 4, 141, 129'BHVD
```

```
20930 DATA 81, 41, 15, 205, 43, 80,
      208, 11, 173, 129'BITE
20940 DATA 81, 41, 240, 13, 44, 80,
      157, 0, 4, 173'BFQF
20950 DATA 128, 81, 240, 37, 173, 129,
      81, 41, 240, 74'BJZH
20960 DATA 74, 74, 74, 205, 43, 80,
      208, 23, 173, 44'BHIH
20970 DATA 80, 10, 10, 10, 10, 72,
      173, 129, 81, 41'BGEI
20980 DATA 15, 141, 129, 81, 104, 13,
      129, 81, 157, 0'BISJ
20990 DATA 4, 232, 208, 187, 238, 191,
      81, 238, 212, 81'BKEL
21000 DATA 238, 254, 81, 136, 208,
      175, 96, 169, 0, 141'BKKA
21010 DATA 58, 82, 174, 58, 82, 189,
      74, 82, 141, 43'BHEA
21020 DATA 80, 189, 59, 82, 141, 44,
      80, 32, 130, 81'BHJB
21030 DATA 32, 52, 82, 238, 58, 82,
      173, 58, 82, 201'BHOC
21040 DATA 15, 208, 225, 96, 169, 4,
      32, 167, 80, 96'BHVD
21050 DATA 0, 15, 8, 5, 14, 2, 9, 2,
      6, 12'BWWC
21060 DATA 11, 11, 11, 11, 11, 0, 1,
      7, 13, 3'BAOE
21070 DATA 10, 8, 4, 14, 15, 5, 2, 6,
      9, 12'BXXE
21080 DATA 11, 32, 114, 80, 169, 160,
      32, 128, 80, 32'BIPB
21090 DATA 120, 80, 169, 192, 32, 167,
      80, 32, 228, 80'BJAD
21100 DATA 32, 6, 81, 96, 169, 100,
      32, 128, 80, 169'BHLA
21110 DATA 96, 32, 167, 80, 169, 92,
      141, 148, 80, 169'BJVC
21120 DATA 216, 32, 172, 80, 173, 254,
      99, 141, 32, 208'BKAD
21130 DATA 173, 255, 99, 141, 33, 208,
      32, 228, 80, 32'BJCE
21140 DATA 15, 81, 96, 32, 26, 81,
      173, 255, 91, 201'BHHE
21150 DATA 72, 208, 3, 32, 6, 81, 96,
      162, 8, 169'BEPF
21160 DATA 7, 160, 7, 32, 186, 255,
      173, 45, 80, 162'BHJA
21170 DATA 46, 160, 80, 32, 189, 255,
      32, 192, 255, 162'BKFC
21180 DATA 7, 32, 198, 255, 169, 95,
      141, 215, 82, 169'BJVD
21190 DATA 255, 141, 214, 82, 32, 207,
      255, 168, 32, 183'BLXE
21200 DATA 255, 41, 64, 208, 14, 140,
      255, 95, 238, 214'BKAC
21210 DATA 82, 208, 3, 238, 215, 82,
      24, 144, 231, 173'BJVD
21220 DATA 255, 95, 141, 255, 91, 169,
      7, 32, 195, 255'BJSE
21230 DATA 32, 231, 255, 162, 1, 169,
      127, 141, 33, 83'BJRF
21240 DATA 141, 36, 83, 169, 64, 141,
      32, 83, 141, 35'BIFF
21250 DATA 83, 32, 31, 83, 169, 131,
      141, 33, 83, 141'BIXA
21260 DATA 36, 83, 169, 40, 141, 32,
      83, 141, 35, 83'BHGB
21270 DATA 32, 31, 83, 169, 6, 141,
      16, 135, 96, 189'BHQC
21280 DATA 64, 127, 141, 64, 127, 238,
      32, 83, 238, 35'BJFE
21290 DATA 83, 208, 13, 238, 33, 83,
      238, 36, 83, 173'BIQE
21300 DATA 36, 83, 201, 136, 240, 3,
      24, 144, 226, 96'BIYC
21310 DATA 162, 8, 169, 7, 160, 0, 32,
      186, 255, 173'BHJD
21320 DATA 45, 80, 162, 46, 160, 80,
      32, 189, 255, 162'BJEF
21330 DATA 0, 160, 92, 169, 0, 32,
      213, 255, 176, 2'BGTF
21340 DATA 169, 0, 133, 251, 96, 162,
      8, 169, 7, 160'BHMA
21350 DATA 0, 32, 186, 255, 173, 45,
      80, 162, 46, 160'BIDB
21360 DATA 80, 32, 189, 255, 162, 0,
      160, 96, 169, 0'BHJC
21370 DATA 32, 213, 255, 176, 2, 169,
      0, 133, 251, 96'BICD
21380 DATA 162, 8, 169, 7, 160, 7, 32,
      186, 255, 173'BHQE
21390 DATA 45, 80, 162, 46, 160, 80,
      32, 189, 255, 32'BIIF
21400 DATA 192, 255, 162, 7, 32, 198,
      255, 169, 91, 141'BKOE
21410 DATA 182, 83, 169, 248, 141,
      181, 83, 32, 207, 255'BLKF
21420 DATA 168, 32, 183, 255, 41, 64,
      208, 14, 140, 248'BKAA
21430 DATA 91, 238, 181, 83, 208, 3,
      238, 182, 83, 24'BIPA
21440 DATA 144, 231, 169, 7, 32, 195,
      255, 32, 231, 255'BKAC
21450 DATA 96, -106984'BKJE
```

END

Listing 3 Title Creator

```
90 SS$="[SPACE27]"'BDTJ
100 IF A=0 THEN A=1:GOTO 710'FILY
110 GOTO 1050'BEDW
120 R=1-R:PRINT R$(R)A$R$(1-R)L$;
    :GOSUB 190:GOTO 120'GDRG
130 MC=MC+1:IF MC>300 THEN GOSUB 1140
    :MC=0:NC=NC+1:IF NC>3 THEN
    NC=0'NHPO
140 IF MC>219 THEN RETURN'EFGC
150 Z8=V:Z9=H:V=24:H=0:GOSUB 600
    :PC=INT(MC):PRINT R$(1);'IHDM
160 IF PC<39 THEN PRINT
    SPC(39-PC)LEFT$(M$(NC),PC);
    :GOTO 180'IAIL
170 PRINT LEFT$(LEFT$(MID$(M$(NC),
    PC-38),39)+SS$,39);'GCLL
180 V=Z8:H=Z9:GOSUB 600:RETURN'EMII
190 GET K$:IF K$=""THEN 130'EIXI
```

```
200 MC=210:IF NC=3 THEN NC=1'FMRC
210 IF K$="[DOWN]"OR K$="[UP]"OR K$="
    [RIGHT]"OR K$="[LEFT]"THEN KB$=K$
    :J$="":GOTO 470'MUXK
220 IF K$="[CLEAR]"THEN J$=""
    :GOTO 1230'FJSD
230 IF ASC(K$)=13 AND K$<>J$THEN H=0
    :GOSUB 600:GOSUB 560:GOSUB 610
    :J$=K$:RETURN'NFYN
240 IF ASC(K$)=13 THEN RETURN'FGQE
250 IF ASC(K$)=34 THEN K$="'"'FIAG
260 IF ASC(K$)=20 THEN K$="[LEFT]
    "'FINH
270 IF K$="[HOME]"AND K$<>J$THEN H=0
    :V=0:GOSUB 600:GOSUB 560:GOSUB 610
    :J$=K$:RETURN'NEJR
280 IF K$="[HOME]"THEN RETURN'ECSG
290 IF ASC(K$)=8 THEN MC=0:NC=2
    :GOTO 190'HQGN
300 IF ASC(K$)=141 AND K$<>J$THEN H=39
    :V=23:GOSUB 600:GOSUB 560
    :GOSUB 610'MFAL
305 IF ASC(K$)=141 AND K$<>J$THEN
    J$=K$:RETURN'JQUL
310 IF ASC(K$)=141 THEN RETURN'FHQC
320 IF ASC(K$)=148 THEN RETURN'FHXD
330 IF ASC(K$)=12 THEN POKE 53272,23
    :RETURN'GPQG
340 IF ASC(K$)=21 THEN POKE 53272,21
    :RETURN'GPOH
350 J$="":IF K$="[F1]"THEN GOSUB 1250
    :GOSUB 630:RETURN'HOAJ
360 IF K$="[F3]"THEN J=1-J:GOSUB 1150
    :GOTO 530'HODK
370 IF K$="[F5]"THEN K=1-K:GOSUB 1150
    :RETURN'HLJL
380 IF K$="[F7]"THEN GOSUB 1250
    :K$=A$'FLPK
390 IF K$="[F2]"THEN GOSUB 1250
    :POKE 53280,(PEEK(53280)AND 15)+1
    :RETURN'JBDR
400 IF K$="[F4]"THEN GOSUB 1250
    :POKE 53281,(PEEK(53281)AND 15)+1
    :RETURN'JBGJ
410 IF K$="[F6]"THEN GOSUB 1250
    :GOTO 840'FKVE
420 IF K$="[F8]"THEN PRINT O$B$;
    :GOTO 860'FLMF
430 PRINT O$B$;:IF K THEN PRINT R$;
    'EKXF
440 PRINT K$O$;'BFGD
450 GOSUB 560:GOSUB 620
    :IF V>23 THEN PRINT L$;
    :GOTO 450'HSEK
460 RETURN'BAQE
470 IF KB$="[RIGHT]"AND H<39 THEN
    H=H+1:GOTO 540'INON
480 IF KB$="[RIGHT]"AND H<39 THEN
    H=H+1:GOTO 540'INOO
490 IF KB$="[LEFT]"AND H>0 THEN H=H-1
    :GOTO 540'IMHP
500 IF KB$="[DOWN]"AND V<23 THEN V=V+1
    :GOTO 540'INMH
510 IF KB$="[UP]"AND V>0 THEN V=V-1
    :GOTO 540'IMMI
520 RETURN'BAQB
530 IF J=0 THEN K=0'EENF
540 GOSUB 600:GOSUB 560
    :IF J THEN CH=YR:CO=CR'GSDL
550 GOSUB 610:RETURN'CEKF
560 V1=PEEK(214):H1=PEEK(211)'EPNK
570 IF H1>39 THEN H1=H1-40
    :GOTO 570'GORM
580 IF V1>24 THEN V1=V1-25
    :GOTO 580'GOCO
590 V=V1:H=H1:C=V*40+H+1024:CH=PEEK(C)
    :CO=PEEK(C+54272):RETURN'MKYY
600 POKE 781,V:POKE 782,H:POKE 783,0
    :SYS 65520:RETURN'FYQI
610 POKE CL,HL:POKE CL+54272,OL
    :IF K THEN IF HL<128 THEN POKE CL,
    HL+128'KGBO
620 CL=C:HL=CH:OL=CO:RETURN'EOLI
630 GOSUB 1140:Z3=V:Z4=H:V=24:H=0
    :GOSUB 600'GXBM
635 PRINT"[RVS]PRESS NEW CURSOR
    CHARACTER.[RVOFF]";'BBBR
640 GET K$:IF K$=""THEN 640'EIEI
650 GET KB$:IF KB$<>""THEN 650'FKJK
660 IF ASC(K$)>127 AND ASC(K$)<161
    THEN K$=A$'ISJP
670 IF ASC(K$)<35 THEN K$=A$'FKNM
680 A$=K$:V=Z3:H=Z4:GOSUB 1150'EROO
690 Z1=V:Z2=H:V=24:H=1:GOSUB 600
    :PRINT O$A$;:YR=PEEK(1985)
    :CR=PEEK(56257)'KSRA
700 V=Z1:H=Z2:GOSUB 600:POKE 1985,32
    :RETURN'FUBI
710 POKE 56,32:POKE 644,32:CLR'DNEG
715 A$="[CMDR +]":B$=" [LEFT]"
    :L$="[LEFT]":R$="[RVS]"
    :O$="[RVOFF]":POKE 650,128'GWVS
720 POKE 53280,6:POKE 53281,12
    :POKE 646,0'DWRJ
730 DIM Q$(1):Q$(0)="[RVS]
    PRESS Y KEY TO DESTROY THIS
    SCREEN![RVOFF]"'CLXR
740 Q$(1)="[RVS]PRESS Y KEY TO SAVE
    THIS SCREEN.[RVOFF]":QQ=0'CJWR
750 DIM M$(3):M$(0)="*SCREEN CREATOR*
    [SPACE3]M. KERYAN --- PRESS
    CONTROL "'CLKV
760 M$(0)=M$(0)+"H FOR HELP. USE ALL
    CHARACTER KEYS, SYMBOLS,
     CURSOR KEYS"'CKMA
770 M$(0)=M$(0)+", ETC. AS USUAL.
    [SPACE40]"'CKVU
780 M$(2)="F1:SELECT CURSOR CHAR.
    [SPACE4]F3:TOGGLE DRAW MODE
    [SPACE2]F5:TOGGLE REVER"'BFAB
790 M$(2)=M$(2)+"SE MODE[SPACE2]F7
    :PRINT CURSOR[SPACE2]F2
    :BORDER COLOR[SPACE2]F4
    :BACKGROUND"'CKTC
800 M$(2)=M$(2)+" COLOR[SPACE2]F6
    :LOAD SCREEN[SPACE2]F8
```

```
     :SAVE SCREEN[SPACE12]"'CKBQ
810 DIM F$(1):F$(Ø)="<OFF>"
     :F$(1)="<ON>":GOSUB 1150'EWKM
820 A=2:DIM R$(1):R$(Ø)="[RVS]"
     :R$(1)="[RVOFF]":PRINT"[CLEAR]";
     'FWJM
830 J=Ø:K=Ø:F=Ø:H=Ø:V=Ø:GOSUB 69Ø
     :GOSUB 56Ø:GOSUB 62Ø:GOTO 12Ø'JFVR
840 GOSUB 118Ø:IF K$<>"Y"THEN
     1Ø4Ø'FLFL
850 GOSUB 125Ø:INPUT"[CLEAR,DOWN3,RVS]
     FILE NAME TO LOAD[RVOFF]";F$
     :LOAD F$,8,1'DPRR
860 QQ=1:GOSUB 118Ø:IF K$="Y"THEN
     88Ø'FOGO
870 GOTO 1Ø4Ø'BECK
880 GOSUB 114Ø:V=24:H=Ø:GOSUB 6ØØ
     :PRINT"[RVS]NOW SAVING SCREEN,
      PLEASE WAIT.[RVOFF]";'FRGA
890 FOR I=1Ø24 TO 17ØØ:POKE I+23552,
     PEEK(I):NEXT I'HWBU
900 GOSUB 114Ø'BEHE
910 FOR I=17Ø1 TO 2Ø47:POKE I+23552,
     PEEK(I):NEXT I'HWIN
920 GOSUB 125Ø:FOR I=55296 TO 56319
     :POKE I-29696,PEEK(I):NEXT I'IEKQ
930 GOSUB 125Ø:POKE 26624,
     PEEK(5328Ø)'DSGL
935 POKE 26625,PEEK(53281)
     :POKE 26626,PEEK(53272)'ECVS
940 GOSUB 114Ø:V=24:H=Ø:GOSUB 6ØØ
     :PRINT"[RVS]FILE NAME FOR THIS
     SCREEN?[RVOFF]";'FRYV
950 F$=""'BCCJ
960 GET K$:IF K$=""THEN 96Ø'EIJN
970 GOSUB 125Ø'BEJL
975 IF K$=CHR$(2Ø)AND LEN(F$)>Ø THEN
     PRINT L$B$;:F$=LEFT$(F$,
     LEN(F$)-1)'MECD
980 IF K$=CHR$(2Ø)THEN 96Ø'EJHP
990 IF K$<>CHR$(13)THEN F$=F$+K$
     :PRINT K$;:GOTO 96Ø'JUEV
1000 GOSUB 125Ø:CLOSE 15:OPEN 15,8,15
     :PRINT#15,"IØ"'ETSY
1010 GOSUB 125Ø:CLOSE 2
     :OPEN 2,8,2,F$+",P,W"'EPMA
1020 GOSUB 125Ø:PRINT#2,CHR$(Ø);
     CHR$(96);'EQBA
1030 GOSUB 125Ø:FOR I=24576 TO 26626
     :PRINT#2,CHR$(PEEK(I));
     :NEXT I'ICKG
1040 GOSUB 125Ø:CLOSE 2:CLOSE 15
     :GOSUB 114Ø:H=Ø:V=Ø:GOSUB 6ØØ
     :GOTO 83Ø'IDPH
1050 GOSUB 125Ø:FOR I=1Ø24 TO 2Ø47
     :POKE I,PEEK(I+23552):NEXT I'ICXI
1060 GOSUB 125Ø:FOR I=55296 TO 56319
     :POKE I,PEEK(I-29696):NEXT I'IEKK
1070 GOSUB 125Ø:POKE 5328Ø,
     PEEK(26624)'DSGF
1075 POKE 53281,PEEK(26625)
     :POKE 53272,PEEK(26626)'ECVM
1080 GOSUB 125Ø:H=Ø:V=24:GOSUB 6ØØ
     :PRINT"[RVS]PRESS ANY KEY TO
     CONTINUE......[RVOFF]";'FRIQ
1090 POKE 198,Ø:FOR I=1 TO 2ØØ
     :GOSUB 125Ø'FQOI
1100 GET K$:IF K$<>""THEN GOSUB 114Ø
     :GOTO 83Ø'HNAB
1110 NEXT I:GOSUB 114Ø'CGMW
1120 GET K$:GOSUB 125Ø:IF K$=""THEN
     112Ø'FOOB
1130 GOTO 83Ø'BDKX
1140 GOSUB 125Ø:POKE 781,24:SYS 599Ø3
     :POKE 781,V:RETURN'FYTF
1150 M$(1)="DRAW MODE = "+F$(J)+"
     [SPACE3]REVERSE MODE = "'DKOK
1155 M$(1)=M$(1)+F$(K)+"[SPACE3]
     CURSOR CHAR = "+A$'ERFO
1160 M$(1)=M$(1)+"[SPACE34]"
     :M$(1)=M$(1)+M$(1)'EBPL
1170 M$(3)=M$(1):GOSUB 125Ø
     :RETURN'DQPF
1180 Z1=V:Z2=H:GOSUB 114Ø:V=24:H=Ø
     :GOSUB 6ØØ:GOSUB 56Ø
     :GOSUB 61Ø'IGJO
1190 PRINT Q$(QQ);:QQ=Ø
     :POKE 198,Ø'DRAI
1200 GET K$:IF K$=""THEN GOSUB 125Ø
     :GOTO 12ØØ'GOTB
1210 IF LEFT$(K$,1)="Y"THEN
     K$="Y"'FIHB
1220 RETURN'BAQW
1230 GOSUB 118Ø:IF K$="Y"THEN RUN'FHYC
1240 GOTO 1Ø4Ø'BECA
1250 G=54272:POKE G+24,15:POKE G+1,11Ø
     :POKE G+5,9:POKE G+6,9
     :POKE G+4,17'LLUO
1260 POKE G+4,16:RETURN'DGXE
```

END

Listing 4 Show Slides

```
150 PRINT"[CLEAR]":IF A=Ø THEN A=1
     : LOAD" SLIDE.ML",8,1'GKFI
160 IF A=1 THEN A=2: GOTO 37Ø'FIPF
170 IF TR$="FADE"THEN SYS 2Ø519'EIVH
180 SYS GT'BCGE
190 TI$="ØØØØØØ":LT=TI:POKE 198,Ø'DOTK
200 IF KP$="WAIT"THEN 27Ø'DGQA
210 ET=TI/6Ø-LT:IF ET>SC THEN 57Ø'GQUF
220 GET K$:IF K$="" THEN 21Ø'EIWC
230 IF K$="[F1]" THEN 27Ø'DFNC
240 IF K$="Q" THEN 33Ø'DFID
250 IF K$="[BACK ARROW]
     " THEN IS=IS-2'FHVG
260 GOTO 57Ø'BDLD
270 GET K$:IF K$<>"" THEN 27Ø'FIGH
280 GET K$'BCQF
290 G=54272:POKE G+24,15
     :POKE G+1,11Ø'FUDM
295 POKE G+5,9:POKE G+6,9:POKE G+4,17
     :POKE G+4,16'IVUT
300 IF K$="[F1]"OR K$="Q"OR K$="
     [BACK ARROW]"THEN 23Ø'HJSE
310 IF K$="" THEN 28Ø'DFLA
320 GOTO 57Ø'BDLA
```

```
330 POKE 53265,(PEEK(53265)AND
    223)'DSSF
340 POKE 53270,(PEEK(53270)AND 207)
    :POKE 53272,21'ECLI
350 POKE 53280,6: POKE 53281,15
    : POKE 646,Ø'DWUI
360 CLOSE 2:CLOSE 15:POKE 56,160
    :POKE 644,160:CLR:PRINT"[CLEAR]"
    :END'HWHM
370 POKE 53280,6: POKE 53281,12
    : POKE 646,Ø: POKE 53272,21'EGQM
380 POKE 56,32:POKE 644,32:POKE 198,Ø
    :CLR:A=2'FWAM
390 PRINT"[CLEAR,DOWN6] [SHFT U,
    SHFT C36,SHFT I]"'BABL
400 PRINT" [SHFT -,SPACE36,SHFT -]
    "'BATE
410 PRINT" [SHFT -,SPACE3]PRESS
    [BACK ARROW] TO GO BACK ONE SLIDE
    [SPACE5,SHFT -]"'BALJ
420 PRINT" [SHFT -,SPACE36,SHFT -]
    "'BATG
430 PRINT" [SHFT -,SPACE3]
    PRESS Q TO QUIT[SPACE18,SHFT -]
    "'BASK
440 PRINT" [SHFT -,SPACE36,SHFT -]
    "'BATI
450 PRINT" [SHFT -,SPACE3]
    PRESS F1 TO PAUSE[SPACE16,SHFT -]
    "'BADM
460 PRINT" [SHFT -,SPACE36,SHFT -]
    "'BATK
470 PRINT" [SHFT -,SPACE3]
    PRESS ANY OTHER KEY TO CONTINUE
    [SPACE2,SHFT -]"'BAHQ
480 PRINT" [SHFT -,SPACE36,SHFT -]
    "'BATM
490 PRINT" [SHFT J,SHFT C36,SHFT K]
    "'BAXL
500 GET K$:IF K$=""THEN 500'EIYD
510 DIM FF(9):FOR I=Ø TO 9:READ FF(I)
    :NEXT'GQCH
520 DATA 8,3,2,6,1,7,5,4,Ø,2'BTVF
530 DIM NA$(5Ø),TY(5Ø),CO(5Ø)'BVQG
540 DIM SN(5Ø),SC(5Ø),KP$(5Ø),
    TR$(5Ø)'BELJ
550 GOSUB 75Ø:TR$="FADE":TY=Ø'DLMJ
560 IS=Ø'BDAG
570 IS=IS+1:IF IS=NS THEN 56Ø'FNLM
580 IF IS<1 THEN IS=1'EGXL
590 T2=TY:SC=SC(IS):KP$=KP$(IS)
    :TR$=TR$(IS):SN=SN(IS)
    :NA$=NA$(SN)'GFNB
600 CO=CO(SN):TP=TY(SN):TY=FF(TP)'DBRJ
610 GT=2048Ø+(TY*3)'DMJF
620 IF GT>205Ø4 THEN GT=205Ø4'EORH
630 CF=255:IF T2=Ø THEN CF=Ø'FMWJ
640 POKE 20522,CF: POKE 252,CO'CPKI
650 IF(TY=1)OR(TY=5) THEN 74Ø'FNQL
660 LL=LEN(NA$):POKE 20525,LL'DQNL
670 FOR I=1 TO LL:POKE 20525+I,
    ASC(MID$(NA$,I,1)):NEXT I'IAVR
680 AD=205Ø7'BHCK
690 IF(TY=7)THEN AD=20513'EMYO
700 IF(TY=2)OR(TY=6)THEN AD=2051Ø'GRQI
710 IF(TP=9)THEN AD=20516'EMUH
720 SYS AD'BCJE
730 CLOSE 7:GOTO 17Ø'CFYG
740 LOAD NA$+"*",8,1'CHTH
750 CLOSE 15:OPEN 15,8,15'CKIJ
760 OPEN 2,8,2,"Ø:SET-UP,S,R"'BGOL
770 INPUT#15,E1,E2$,E3,E4'BPFL
780 IF E1>Ø THEN PRINT"[SPACE2,RVS]
    "E2$"[RVOFF]":GOTO 39Ø'FKBP
790 INPUT#2,Z$:NP=Ø:NS=Ø'DMOO
800 A1$="":INPUT#2,A1$,A2$,A3$
    :IF A1$="END"OR A1$=""THEN
    82Ø'HCKM
810 NP=NP+1:NA$(NP)=A1$
    :TY(NP)=VAL(A2$):CO(NP)=VAL(A3$)
    :GOTO 8ØØ'ITBS
820 A1$="":INPUT#2,A1$,A2$,A3$,A4$
    :IF A1$="END"OR A1$=""THEN
    84Ø'HGDP
830 NS=NS+1:SN(NS)=VAL(A1$)
    :SC(NS)=VAL(A2$)'GEBQ
835 KP$(NS)=A3$:TR$(NS)=A4$
    :GOTO 82Ø'DACR
840 CLOSE 2:RETURN'CCDH
```

END

BY ROYAL C. JONES

Kaleidoscope

for the Commodore 64

A kaleidoscope is a great way to show off the color capabilities of your Commodore 64 without a great deal of programming. Here is a kaleidoscope program that will give you an inexhaustible supply of colorful patterns.

The technique here is simple enough. Lines 30 to 60 set up the screen with a 24-by-24 rectangle of reverse blanks. The double loop from lines 100 to 210 then makes the patterns by poking color memory. The expressions used in the POKE statements are a bit complicated, but the basic idea is to divide the pattern into eight symmetric sections. This is not the threefold symmetry of the traditional kaleidoscope, which requires more tricks than I have in my programming bag.

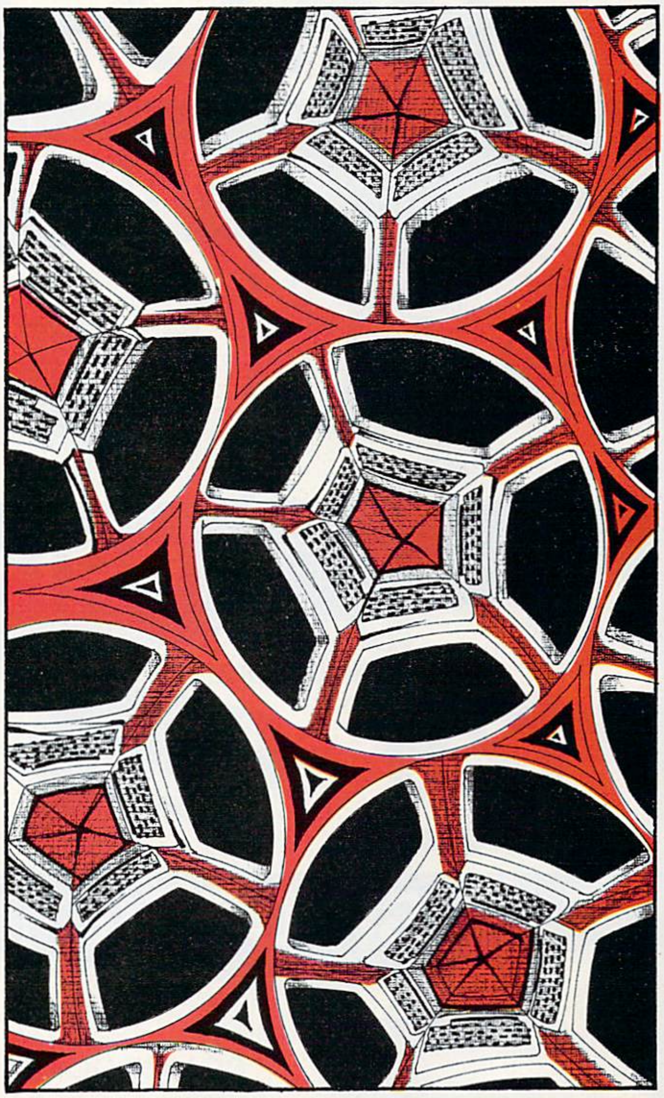
You can change the mix of colors by changing the constants in line 120, or by changing the entire expression. Replacing the + sign with a * sign, for example, gives you quite a different mix. But the real fun of this program is the endless possibilities for non-random patterns, which I discovered only after writing the random version.

To change the program to non-random patterns, add this line to the program: 215 N=(N+1)AND 15. This gives us a color variable for the non-random patterns. The crucial line is 120, and the variables that will be used, besides the color variable, are the loop counters I and J.

Try replacing line 120 with 120 C=I+N and then with 120 C=J+N. An interesting contrast, but we have hardly begun.

Now try 120 C=I+J+N and 120 C=ABS(I−J)+N. Now you're getting the idea. Each formula for assigning a color to C yields a different pattern. Let's see if you can come up with your own formulas for some really striking designs.

Just one bit of advice. With a complicated formula, it is sometimes better to limit the number of resulting colors by masking bits. For example: 120 C=(((I+13)/(J+1))AND 2)+N. The "AND 2" limits the design to two colors, but also makes it stand out when there is a vivid contrast. C



Show off the color capabilities of your Commodore 64.

Before typing these programs, read "How to Enter Programs," and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007, 1-800-831-2694.

Kaleidoscope

```
30 PRINT"[CLEAR]";'BBDA
40 FOR I=1 TO 24:PRINT TAB(8)"[RVS]";
   'FISE
50 FOR J=1 TO 24:PRINT" ";'EGEE
60 NEXT J:PRINT:NEXT I'DENE
70 R=23:REM NUMBER OF ROWS -1'CSGJ
80 L=40:REM LENGTH OF LINE'CQTJ
90 M=55296+8:REM COLOR MEMORY'DTNM
100 FOR I=Ø TO 11'DECW
110 FOR J=I TO 11'DEDX
120 C=INT(RND(1)*4)+5'FIVB
130 POKE M+I*L+J,C'EGYC
140 POKE M+J*L+I,C'EGYD
150 POKE M+(R-J)*L+I,C'FJCF
160 POKE M+(R-I)*L+J,C'FJCG
170 POKE M+(R-I)*L+R-J,C'GKYI
180 POKE M+(R-J)*L+R-I,C'GKYJ
190 POKE M+J*L+R-I,C'FHVJ
200 POKE M+I*L+R-J,C'FHVB
210 NEXT J,I'BDOX
220 FOR I=1 TO 3000:NEXT:GOTO 100'FLKD
```

END


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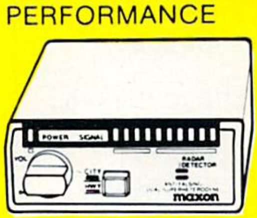
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BY WALTER E. MEYERS

E.S.P.

for the Commodore 64

The scientific study of extrasensory perception (ESP) began in the 1930's at Duke University under Dr. Joseph Rhine. These studies, which were very controversial, led one skeptical psychologist to sneer that ESP stood for "error some place." Now, with this simple game for the Commodore 64, you can judge for yourself.

ESP studies often used (and still do) a special deck of 25 cards. These Zener cards, as they are called, each bear one of five figures: a circle, a square, a cross, a star, or several wavy lines. There are five cards of each figure in the deck. The subject, often separated from the examiner by a screen or in another room, guessed which figure appeared on the card as it was turned over.

The program E.S.P. makes you the subject. After a brief title display, you will see the back of a card on the screen. The five figures appear below it, and beneath them is the pointer. The program selects a card from the deck of 25 and you are asked to guess which figure it carries.

With a joystick in port two, move the pointer to your figure choice, then hit the fire button. You will immediately see the card that the computer has turned up, and your score will be updated. After 25 cards have been turned, you will receive an evaluation of your score and be given the opportunity to quit, review your earlier scores at the current sitting, or play another round.

You may question whether mind reading is the correct term for what you're doing here, because presumably the computer has no mind, so what the player does can hardly be called mind reading. Perhaps the right term is *precognition,* foretelling which card is going to turn up, or maybe it is yet another psychic skill.

CARDS CORRECT	TOTAL PROBABILITY
CARDS CORRECT = 1	TOTAL PROBABILITY = % 99.622
CARDS CORRECT = 2	TOTAL PROBABILITY = % 97.261
CARDS CORRECT = 3	TOTAL PROBABILITY = % 90.177
CARDS CORRECT = 4	TOTAL PROBABILITY = % 76.6
CARDS CORRECT = 5	TOTAL PROBABILITY = % 57.932
CARDS CORRECT = 6	TOTAL PROBABILITY = % 38.331
CARDS CORRECT = 7	TOTAL PROBABILITY = % 21.996
CARDS CORRECT = 8	TOTAL PROBABILITY = % 10.912
CARDS CORRECT = 9	TOTAL PROBABILITY = % 4.677
CARDS CORRECT = 10	TOTAL PROBABILITY = % 1.733
CARDS CORRECT = 11	TOTAL PROBABILITY = % .555
CARDS CORRECT = 12	TOTAL PROBABILITY = % .154
CARDS CORRECT = 13	TOTAL PROBABILITY = % .036
CARDS CORRECT = 14	TOTAL PROBABILITY = % .007
CARDS CORRECT = 15	TOTAL PROBABILITY = % .001
CARDS CORRECT = 16	TOTAL PROBABILITY = % <.001
CARDS CORRECT = 17	TOTAL PROBABILITY = % <.001
CARDS CORRECT = 18	TOTAL PROBABILITY = % <.001
CARDS CORRECT = 19	TOTAL PROBABILITY = % <.001
CARDS CORRECT = 20	TOTAL PROBABILITY = % <.001
CARDS CORRECT = 21	TOTAL PROBABILITY = % <.001
CARDS CORRECT = 22	TOTAL PROBABILITY = % <.001
CARDS CORRECT = 23	TOTAL PROBABILITY = % <.001
CARDS CORRECT = 24	TOTAL PROBABILITY = % <.001

Table 1. The probability that any correct number of cards were guessed by chance. A probability of less than 5% is considered significant.

Try your hand at reading your computer's "mind."

The program, which uses six sprites for the main part of the display, is written in a straightforward BASIC. It not only illustrates that even the default values of the Commodore 64 can provide striking graphics, but what really makes a game most interesting is its subject.

Before typing these programs, read "How to Enter Programs," and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007, 1-800-831-2694.

E.S.P.

```
10 GOTO 100'BDAX
30 FOR T=1 TO 30:NEXT:RETURN'FGQD
50 POKE 781,LN:POKE 782,COL:POKE 783,0
   :SYS 65520:RETURN'FCIJ
60 N=INT(RND(1)*25+1):IF C(N)=0 THEN
   60'IRXK
70 DECK=DECK-1:RETURN'DKGH
100 PRINT"[CLEAR,DOWN2,RIGHT2]POKING."
   :X=RND(-TI):V=53248:S=54272'GUSG
105 DIM C(26),G(20):SPRITE=12288'CXLG
110 FOR J=1 TO 6:FOR I=0 TO 63:READ A
   :POKE SPRITE+I,A:NEXT:SP=SP+64
   :NEXT'NEQL
120 FOR I=1 TO 5:POKE V+I+39,1
   :POKE 2040+I,191+I:NEXT'KWTI
125 POKE 2046,197:POKE V+45,7
   :POKE V+39,2:POKE V+23,1'HBAL
130 POKE V+29,1:POKE V,156
   :POKE V+1,102:GAME=1:H=90
   :FOR I=2 TO 10 STEP 2'LJUM
140 POKE V+I,H:POKE V+I+1,190:H=H+40
   :NEXT:POKE V+13,210'KBWL
199 REM STRINGS'BHJP
200 B1$="[LOWER CASE,GRAY2,RVS,
   SHFT SPACE,SPACE5,SHFT SPACE,DOWN,
   LEFT7,SHFT SPACE,BLUE,CMDR +5,
   GRAY2,SHFT SPACE,DOWN,LEFT7]"'BDFN
205 B1$=B1$+" [BLUE,CMDR +5,GRAY2,
   SHFT SPACE,DOWN,LEFT7,SHFT SPACE,
   BLUE,CMDR +5,GRAY2,SHFT SPACE,
   DOWN,LEFT7]"'CGWW
210 B1$=B1$+"[SHFT SPACE,BLUE,CMDR +5,
   GRAY2,SHFT SPACE,DOWN,LEFT7,
   SHFT SPACE,BLUE,CMDR +5,GRAY2,
   SHFT SPACE,DOWN,LEFT7,SHFT SPACE,
   SPACE6]"'CGRU
220 B2$="[WHITE,RVS,SPACE7,DOWN,LEFT7]
    [SHFT SPACE5] [DOWN,LEFT7]
   [SHFT SPACE5] [DOWN,LEFT7]
   [SHFT SPACE5] [DOWN,LEFT7]"'BDBC
230 B2$=B2$+"[RVS] [SHFT SPACE5]
   [DOWN,LEFT7] [SHFT SPACE5] [DOWN,
```

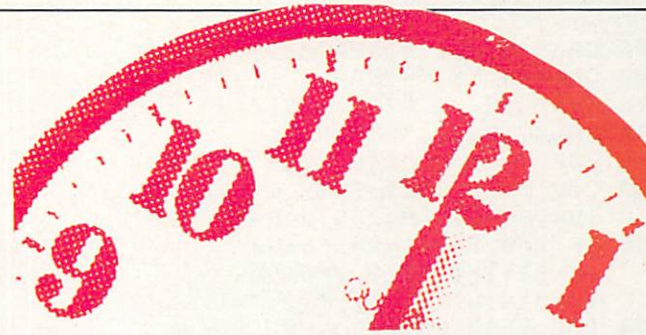
```
    LEFT7,SPACE7]"'CGOS
240 T$(0)="[RVS,SPACE5,RVOFF,SPACE4,
    RVS,SHFT POUND,SPACE4,CMDR *,
    RVOFF,SPACE4,RVS,SPACE6,CMDR *]
    "'BFFI
250 T$(1)="[RVS,SPACE2,RVOFF,SPACE7,
    RVS,SPACE2,RVOFF,SPACE2,RVS,
    SPACE2,RVOFF,SPACE4,RVS,SPACE2,
    RVOFF,SPACE3,RVS,SPACE2]"'BFUI
260 T$(2)="[RVS,SPACE2,RVOFF,SPACE7,
    RVS,SPACE2,RVOFF,SPACE8,RVS,
    SPACE2,RVOFF,SPACE3,RVS,SPACE2]
    "'BFMI
270 T$(3)="[RVS,SPACE4,RVOFF,SPACE5,
    CMDR *,RVS,SPACE4,CMDR *,RVOFF,
    SPACE4,RVS,SPACE6,RVOFF,
    SHFT POUND]"'BFFL
275 T$(4)="[RVS,SPACE2,RVOFF,SPACE11,
    RVS,SPACE2,RVOFF,SPACE4,RVS,
    SPACE2]"'BFUN
280 T$(5)="[RVS,SPACE2,RVOFF,SPACE4,
    CMDR I2] [RVS,SPACE2,RVOFF,SPACE2,
    RVS,SPACE2,RVOFF] [CMDR I2] [RVS,
    SPACE2,RVOFF] [CMDR I2]"'BFKO
290 T$(6)="[RVS,SPACE5,RVOFF] [RVS,
    SPACE2,RVOFF] [CMDR *,RVS,SPACE4,
    RVOFF,SHFT POUND] [RVS,SPACE2,
    RVOFF] [RVS,SPACE2,RVOFF] [RVS,
    SPACE2]"'BFTO
299 REM TITLE'BFRQ
300 POKE 53281,0:POKE 53280,0
    :PRINT"[CLEAR,UPPER CASE]"
    :H$="[WHITE,RED,CYAN,PURPLE,GREEN,
    BLUE,YELLOW,ORANGE,BROWN,L. RED,
    L. GREEN,L. BLUE]"'ETTJ
310 FOR J=1 TO 3:FOR I=1 TO 12
    :PRINT"[HOME,DOWN10]" MID$(H$,I,
    1)'IRQH
320 FOR K=0 TO 6:PRINT TAB(7) T$(K)
    :NEXT:NEXT:NEXT'IOPG
389 REM INITIALIZE'BKDR
390 FOR I=1 TO 5:C(I)=1:C(I+5)=2
    :C(I+10)=3:C(I+15)=4:C(I+20)=5
    :NEXT'NQBX
395 POKE V+12,170'CHON
399 REM MAIN LOOP'BIMR
400 POKE S+24,15:C0=3:CS=0:WS=0
    :COLLECT K=25:PRINT"[CLEAR,DOWN5,
    SPACE2,WHITE,SHFT R]IGHT"SPC(24)"
    [SHFT W]RONG"'JBEP
410 COL=16:LN=5:GOSUB 50:POKE V+21,126
    :PRINT B1$:GOSUB 60:CC=C(N)
    :C(N)=0'JPQN
420 LN=15:COL=3:GOSUB 50
    :PRINT"[SPACE7,YELLOW,SHFT M]
    AKE YOUR SELECTION:[SPACE6]"'ENMO
430 RECORD=NOT PEEK(56320)AND 15
    :FIRE=(PEEK(56320)AND 16)/16
    :IF FIRE=0 THEN 470'MLAR
440 IF JOY=8 THEN IF PEEK(V+12)<250
    THEN POKE V+12,PEEK(V+12)+40
    :C0=C0+1'PELS
450 IF JOY=4 THEN IF PEEK(V+12)>90
    THEN POKE V+12,PEEK(V+12)-40
    :C0=C0-1'PDLT
460 GOSUB 30:GOTO 430'CGXG
470 POKE 2040,191+CC:COL=16:LN=5
    :GOSUB 50:PRINT B2$
    :POKE V+21,127'IKIR
480 POKE S+5,12:POKE S+6,9
    :POKE S+1,CC*1.5+CC
    :POKE S+15,19+CC:POKE S+4,21'NLIW
490 FOR T=1 TO 15:QU=T-INT(T/10)*10
    :POKE S,QU*20:NEXT:POKE S+4,
    20'NEYW
499 REM UPDATE SCORE'BLFT
500 IF C0=CC THEN CS=CS+1
    :GOTO 520'GNOF
510 WS=WS+1'CFYC
520 LN=7:COL=4:GOSUB 50:PRINT CS
    :COL=33:GOSUB 50:PRINT WS
    :C(N)=0'IHLN
530 LN=15:COL=3:GOSUB 50
    :PRINT"[L. GREEN,SHFT H]
    IT THE BUTTON FOR THE NEXT
    CARD."'ENWR
540 FIRE=(PEEK(56320)AND 16)/16
    :IF FIRE=1 THEN 540'HBPN
550 IF DECK>0 THEN 410'DIPH
560 PRINT"[HOME,DOWN,YELLOW,SHFT Y]
    OUR SCORE WAS[WHITE]" CS "[YELLOW]
    RIGHT OUT OF 25.":R$=" JUST ABOUT
    "'CFBU
570 IF CS>5 THEN R$=" HIGHER THAN
    "'EFIN
580 IF CS<5 THEN R$=" LOWER THAN
    "'EFTN
590 PRINT"[SHFT Y]OUR RESULT
    WAS"R$"WHAT WOULD[SPACE2]
    BE EXPECTED.":LN=14:COL=0
    :GOSUB 50'EPUA
600 PRINT"[YELLOW,SHFT P]RESS [WHITE,
    SHFT S,YELLOW] TO REVIEW YOUR
    SCORES, [WHITE,SHFT Q,YELLOW]
     TO QUIT[SPACE4]OR ANY OTHER ";
    'BBMT
610 PRINT"KEY TO CONTINUE.[SPACE3]"
    :G(GAME)=CS'CKDJ
620 POKE 198,0:WAIT 198,1:I=PEEK(631)
    :POKE 198,0:IF I=81 THEN 650'IGXN
630 IF I=83 THEN 660'DGBG
640 GAME=GAME+1:GOTO 390'DNGJ
650 PRINT"[CLEAR,UPPER CASE,L. BLUE]"
    :POKE V+21,0:POKE 53280,14
    :POKE 53281,6:CLR:NEW:END'IBLQ
660 POKE V+21,0:PRINT"[CLEAR,DOWN2,
    SHFT S]CORES:":FOR I=1 TO GAME
    :PRINT"[SPACE2,SHFT G]AME"I"[LEFT]
    :"G(I);'HUDV
670 NEXT:PRINT:GOTO 600'DFXJ
699 REM ----------------SPRITE
    DATA'BBEY
700 DATA 0,255,0,3,129,192,14,0,
    112'BBOG
```

```
701 DATA 24,0,24,48,0,12,96,0,6'BWDG
702 DATA 192,0,3,192,0,3,192,0,3'BXXH
703 DATA 192,0,3,96,0,6,48,0,12'BWGI
704 DATA 24,0,24,14,0,112,3,129,
     192'BBOK
705 DATA 0,255,0,0,0,0,0,0,0'BTEJ
706 DATA 0,0,0,0,0,0,0,0,0,0'BTNK
709 :'ABHK
710 DATA 0,0,0,127,255,254,96,0,6'BYZH
711 DATA 96,0,6,96,0,6,96,0,6'BUWH
712 DATA 96,0,6,96,0,6,96,0,6'BUWI
713 DATA 96,0,6,96,0,6,96,0,6'BUWJ
714 DATA 96,0,6,96,0,6,127,255,
     254'BASL
715 DATA 0,0,0,0,0,0,0,0,0'BRVK
716 DATA 0,0,0,0,0,0,0,0,0,0'BTNL
719 :'ABHL
720 DATA 0,60,0,0,60,0,0,60,0'BUCH
721 DATA 0,60,0,0,60,0,0,60,0'BUCI
722 DATA 127,255,254,127,255,254,0,60,
     0'BFYL
723 DATA 0,60,0,0,60,0,0,60,0'BUCK
724 DATA 0,60,0,0,60,0,0,0,0'BTEK
725 DATA 0,0,0,0,0,0,0,0,0'BRVL
726 DATA 0,0,0,0,0,0,0,0,0,0'BTNM
729 :'ABHM
730 DATA 0,24,0,0,60,0,0,60,0'BUCI
731 DATA 0,102,0,255,231,255,96,0,
     6'BBUK
732 DATA 24,0,24,6,0,96,1,129,128'BYCL
733 DATA 3,0,192,3,24,192,6,102,
     96'BADM
734 DATA 7,129,224,14,0,112,12,0,
     48'BBRN
735 DATA 0,0,0,0,0,0,0,0,0'BRVM
736 DATA 0,0,0,0,0,0,0,0,0,0'BTNN
739 :'ABHN
740 DATA 0,0,0,0,0,0,7,192,124'BVIJ
741 DATA 28,113,198,112,31,0,7,192,
     124'BEWM
742 DATA 28,113,198,112,31,0,7,192,
     124'BEWN
743 DATA 28,113,198,112,31,0,7,192,
     124'BEWO
744 DATA 28,113,198,112,31,0,0,0,
     0'BAJO
745 DATA 0,0,0,0,0,0,0,0,0'BRVN
746 DATA 0,0,0,0,0,0,0,0,0,0'BTNO
749 :'ABHO
750 DATA 0,6,0,0,15,0,0,15,0'BTFK
751 DATA 0,15,0,0,15,0,0,15,0'BUCL
752 DATA 0,207,0,9,207,0,25,192,0'BYRN
753 DATA 57,207,224,56,15,224,3,224,
     224'BFAP
754 DATA 63,207,224,63,223,224,31,255,
     192'BHBQ
755 DATA 12,127,128,1,252,0,7,255,
     128'BDBQ
756 DATA 0,0,0,3,255,0,3,255,0,0'BXEQ
```

END

BY JERRY A. STURDIVANT

Basic Clock
for the Commodore 128



Basic Clock puts a clock face on your screen, with moving hour, minute and second hands. It is just your basic clock (no pun intended). It is written so it is simple and easy to understand. After you enter the program, you can start adding frills from there.

You can make the screen dark for PM and light for AM, or have it print AM or PM and change color every hour. You can add quarter-hour chimes and on-the-hour gongs. You can have the numbers light up and the hands change color. You can even build in an alarm clock. It keeps track of the time according to TI$.

The Program

In listing one, line 20 has you input the time in six figures. You can enter 12-hour or 24-hour time; it won't matter because it's a 12-hour clock. For simplicity, I made the clock start at zero seconds, regardless of the seconds you enter, so you should also make your entry zero seconds.

Lines 40 and 50 take the minutes and hours from TI$ for some math. Lines 70 through 130 put the numbers on the screen. Then we enter the Minutes (M) loop.

Line 150 is for advancing the hour hand as the minute hand moves around the clock. Every 12 minutes the hour hand advances six degrees, or ⅕ of an hour.

Line 160 is only used once. It takes the numbers your entered on start up and makes the necessary calculations for placing the hour and minute hands in the correct positions. This is done by advancing the Minutes FOR-NEXT loop (M) to the correct number and calculating the H for the hour hand.

Now we enter the Seconds (S) loop. All three hands are printed on the screen. Then we take TI$ and wait for it to change to the next second. When it does, line 230 gives us a chance to get out of the program with a touch of a key. It you're going to add anything to the program, make a line 205 and make your additions there. Don't try to add too much, you don't have much time.

Line 240 erases the second hand. Then we loop back to print a new one six degrees further on, along with the other hands just in case we erased a part of them. When the second hand has gone the full 360 degrees, we drop to the Minute loop to advance that hand one step (six degrees).

It may seem unusual to use the CIRCLE command to draw lines, but it has a handy built-in degree function, and by putting 255 in the last CIRCLE parameter, it makes straight lines.

Keep track of time with an on-screen clock.

Hands

One of the first changes you might want to make is to give your clock hands like a regular clock rather than just lines. It is a little tricky changing the CIRCLE command, so I'll give you the changes here.

```
140 FOR M=270 TO 629 STEP 6
150 C=C+1:IF C=12 THEN
    CIRCLE 0,156,100,55,4,,,H,108:
    H=H+6:C=0
160 IF T=0 THEN
    M=M1*6+270:H=H1+INT(M1/12)*6+270:
    C=M1-INT(M1/12)*12:T=1
170 FOR S=270 TO 629 STEP 6
180 CIRCLE,156,100,88,1,,,S,108
190 CIRCLE,156,100,83,2,,,M,108
200 CIRCLE,156,100,55,4,,,H,108
240 CIRCLE 0,156,100,88,1,,,S,108
260 CIRCLE 0,156,100,83,2,,,M,108
```

In effect, all the 90 numbers are changed to 270, the 449 numbers to 629, and the 255 numbers to 108.

The third parameter in the CIRCLE command is the length of the hand. The fourth parameter is the width of the end of the hand. The 108 has to do with the shape. If you play with these numbers, you can change the shape of the hands to whatever you like.

Listing 2 is Round Clock. This program is not as simple. The Basic Clock in Listing 1 is oval in shape because the screen pixels are taller than they are wide. So as the hands of the clock move around the screen, they become shorter as they become horizontal and longer as they become vertical.

Listing 2 makes the corrections necessary for a round clock by changing the length of the hands as they move around. ■

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007, 1-800-831-2694.

Listing 1 Basic Clock

```
20 INPUT"INPUT TIME - 6 FIGURES";
   TI$'BEXF
30 COLOR 4,12:COLOR 0,12'CJMC
40 M1=VAL(MID$(TI$,3,2))'DNWE
50 H1=VAL(LEFT$(TI$,2))*30'ENKG
60 GRAPHIC 1,1'BDHD
70 CHAR,19,0,"12"'BGXF
80 CHAR,12,2,"11[SPACE11]1"'BGNH
90 CHAR,8,6,"10[SPACE20]2"'BFGJ
```

```
100 CHAR,6,12,"9[SPACE25]3"'BGNA
110 CHAR,8,18,"8[SPACE21]4"'BGTB
120 CHAR,13,23,"7[SPACE12]5"'BHBB
130 CHAR,19,24,"6"'BHGA
140 FOR M=90 TO 449 STEP 6'EHND
150 C=C+1:IF C=12 THEN CIRCLE 0,156,
    100,60,0,,,H,255:H=H+6:C=0'JLUN
160 IF T=0 THEN M=M1*6+90
    :H=H1+INT(M1/12)*6+90
    :C=M1-INT(M1/12)*12:T=1'SLMV
170 FOR S=90 TO 449 STEP 6'EHTG
180 CIRCLE,156,100,93,0,,,S,255'BVYH
190 CIRCLE,156,100,88,0,,,M,255'BVWI
200 CIRCLE,156,100,60,0,,,H,255'BVHA
210 P1$=TI$'BGYY
220 P2$=TI$:IF P1$=P2$ THEN 220'EQWE
230 GET A$:IF A$<>"" THEN 290'FIND
240 CIRCLE 0,156,100,93,0,,,S,255'BWQF
250 NEXT S'BBMB
260 CIRCLE 0,156,100,88,0,,,M,255'BWOH
270 NEXT M'BBGD
280 GOTO 140'BDEF
290 GRAPHIC 0'BBOG
```

END

Listing 2 Round Clock

```
20 INPUT"[CLEAR]INPUT TIME - 6
   FIGURES";TI$'BEVF
30 COLOR 4,7:COLOR 0,7:COLOR 1,2'DLAD
40 M1=VAL(MID$(TI$,3,2))'DNWE
50 H1=VAL(LEFT$(TI$,2))*30'ENKG
60 GRAPHIC 1,1'BDHD
70 CHAR,11,0,"[SPACE7]12[SPACE7]"'BGBH
80 CHAR,12,1,"11[SPACE12]1"'BGOI
90 CHAR,6,5,"10[SPACE23]2"'BFSK
100 CHAR,3,12,"9[SPACE31]3"'BGVB
110 CHAR,7,19,"8[SPACE23]4"'BGHB
120 CHAR,13,23,"7[SPACE11]5"'BHAA
130 CHAR,12,24,"[SPACE7]6[SPACE7]
    "'BHKC
140 REM     MINUTE HAND LOOP'BOGD
160 DO'BAJB
170 FOR M=270 TO 629 STEP 6'EIKG
180 REM     CHECK HOUR HAND MOVE'BRYI
200 C=C+1:IF C=12 THEN CIRCLE 0,156,
    100,55+HA*2,4,,,H,108:H=H+6
    :C=0'LORL
205 HA=HA+1:HB=HA+HC:IF HA>15 THEN
    HC=16:HA=HA-2:IF HA=0 THEN
    HC=0'OJLS
210 REM     SET HANDS ON START'BPUC
230 IF T=0 THEN BEGIN:M=M1*6+270
    :H=H1+INT(M1/12)*6+270
    :C=M1-INT(M1/12)*12'SMAT
240 M2=INT(M1/15)'DIYD
245 MA=ABS(M1*(M2=0)+(30-M1)*(M2=1)+
    (M1-30)*(M2=2)+(60-M1)*(M2=3))
    'QTSY
250 H1=H1/30+12*(H1>359)
    :H1=H1*5+INT(M1/12)
    :H2=INT(H1/15)'NLAR
255 HA=ABS(H1*(H2=0)+(30-H1)*(H2=1)+
    (H1-30)*(H2=2)+(60-H1)*(H2=3)):T=1
    :BEND'SYLD
260 REM     SECOND HAND LOOP'BOJG
280 FOR S=270 TO 629 STEP 6'EIQI
290 CIRCLE,156,100,88+SA*2,1,,,S,
    108'DYYM
300 CIRCLE,156,100,83+MA*2,2,,,M,
    108'DYIE
310 CIRCLE,156,100,55+HA*2,4,,,H,
    108'DYEE
320 REM     PAUSE'BFNB
340 P1$=TI$'BGYD
350 P2$=TI$:IF P1$=P2$ THEN 350'EQAI
360 GET A$:IF A$<>"" THEN 480 'FIOH
370 REM     ERASE SECONDS'BMOI
390 CIRCLE 0,156,100,88+SA*2,1,,,S,
    108'DAVN
400 SA=SA+1:SB=SA+SC:IF SB>15 THEN
    SC=16:SA=SA-2:IF SA=0 THEN
    SC=0'OJCQ
410 NEXT S'BBMY
420 REM     ERASE MINUTES'BMKE
440 CIRCLE 0,156,100,83+MA*2,2,,,M,
    108'DAFJ
450 MA=MA+1:MB=MA+MC:IF MB>15 THEN
    MC=16:MA=MA-2:IF MA=0 THEN
    MC=0'OJRU
460 NEXT M'BBGE
470 LOOP'BAKF
480 GRAPHIC 0'BBOH
```

END

USER GROUPS

Although there are almost 1000 known Commodore user groups nationwide and around the world, this list includes only those that have been officially recognized by Commodore as Approved User Groups. If your group would like to apply for Approved status, contact Pete Baczor, User Group Coordinator, at Commodore Business Machines, 1200 Wilson Drive, West Chester, PA 19380.

Commodore user groups provide invaluable assistance to Commodore computerists. If you are looking for people who share your computing interests, or if you need help getting started with your computer, contact the group near you.

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HOW TO ENTER PROGRAMS

The programs which appear in this magazine have been run, tested and checked for bugs and errors. After a program is tested, it is printed on a letter quality printer with some formatting changes. This listing is then photographed directly and printed in the magazine. Using this method ensures the most error-free program listings possible.

Whenever you see a word inside brackets, such as [DOWN], the word represents a keystroke or series of keystrokes on the keyboard. The word [DOWN] would be entered by pressing the cursor-down key. If multiple keystrokes are required, the number will directly follow the word. For example, [DOWN4] would mean to press the cursor-down key four times. If there are multiple words within one set of brackets, enter the keystrokes directly after one another. For example, [DOWN,RIGHT2] would mean to press the cursor-down key once and then the cursor-right key twice. Note: Do not enter the commas.

In addition to these graphic symbols, the keyboard graphics are all represented by a word and a letter. The word is either SHFT or CMD and represents the SHIFT key or the Commodore key. The letter is one of the letters on the keyboard. The combination [SHIFT E] would be entered by holding down the SHIFT key and pressing the E. A number following the letter tells you how many times to type the letter. For example, [SHFT A4,CMD B3] would mean to hold the SHIFT key and press the A four times, then hold down the Commodore key and press the B three times.

The following chart tells you the keys to press for any word or words inside of brackets. Refer to this chart whenever you aren't sure what keys to press. The little graphic next to the keystrokes shows you what you will see on the screen.

Syntax Error

This is by far the most common error encountered while entering a program. Usually (sorry folks) this means that you have typed something incorrectly on the line the syntax error refers to. If you get the message "?Syntax Error Break In Line 270," type LIST 270 and press RETURN. This will list line 270 to the screen. Look for any non-obvious mistakes like a zero in place of an O or vice-versa. Check for semicolons and colons reversed and extra or missing parentheses. All of these things will cause a syntax error.

There is only one time a syntax error will tell you the wrong line to look at. If the line the syntax error refers to has a function call (e.g., FN A(3)), the syntax error may be in the line that defines the function, rather than the line named in the error message. Look for a line near the beginning of the program (usually) that has DEF FN A(X) in it with an equation following it. Look for a typo in the equation part of this definition.

Illegal Quantity Error

This is another common error message. This can also be caused by a typing error, but it is a little harder to find. Once again, list the line number that the error message refers to. There is probably a poke statement on this line. If there is, then the error is referring to what is trying to be poked. A number must be in the range of zero to 255 to be poke-able. For example, the statement POKE 1024,260 would produce an illegal quantity error because 260 is greater than 255.

Most often, the value being poked is a variable (A,X...). This error is telling you that this variable is out of range. If the variable is being read from data statements, then the problem is somewhere in the data statements. Check the data statements for missing commas or other typos.

If the variable is not coming from data statements, then the problem will be a little harder to find. Check each line that contains the variable for typing mistakes.

Out Of Data Error

This error message is always related to the data statements in a program. If this error occurs, it means that the program has run out of data items before it was supposed to. It is usually caused by a problem or typo in the data statements. Check first to see if you have left out a whole line of data. Next, check for missing commas between numbers. Reading data from a page of a magazine can be a strain on the brain, so use a ruler or a piece of paper or anything else to help you keep track of where you are as you enter the data.

Other Problems

It is important to remember that the 64 and the PET/CBM computers will only accept a line up to 80 characters long. The VIC 20 will accept a line up to 88 characters long and the 128 a line up to 160 characters long. Sometimes you will find a line in a program that runs over this number of characters. This is not a mistake in the listing. Sometimes programmers get so carried away crunching programs that they use abbreviated commands to get more than the standard number of characters on one line.

"[HOME]" = UNSHIFTED CLR/ HOME
"[CLEAR]" = SHIFTED CLR/HOME
"[DOWN]" = CURSOR DOWN
"[UP]" = CURSOR UP
"[RIGHT]" = CURSOR RIGHT
"[LEFT]" = CURSOR LEFT
"[RVS]" = CONTROL 9
"[RVOFF]" = CONTROL 0
"[BLACK]" = CONTROL 1
"[WHITE]" = CONTROL 2
"[RED]" = CONTROL 3
"[CYAN]" = CONTROL 4
"[PURPLE]" = CONTROL 5
"[GREEN]" = CONTROL 6
"[BLUE]" = CONTROL 7
"[YELLOW]" = CONTROL 8
"[ORANGE]" = COMMODORE 1
"[BROWN]" = COMMODORE 2
"[L. RED]" = COMMODORE 3
"[GRAY1]" = COMMODORE 4
"[GRAY2]" = COMMODORE 5
"[L. GREEN]" = COMMODORE 6
"[L. BLUE]" = COMMODORE 7
"[GRAY3]" = COMMODORE 8
"[F1]" = F1
"[F2]" = F2
"[F3]" = F3
"[F4]" = F4
"[F5]" = F5
"[F6]" = F6
"[F7]" = F7
"[F8]" = F8
"[POUND]" = ENGLISH POUND
"[SHFT ↑]" = PI SYMBOL
"[↑]" = UP ARROW

GRAPHIC SYMBOLS WILL BE REPRESENTED AS EITHER THE LETTERS SHFT (SHIFT) AND A KEY ("[SHFT Q,SHFT J,SHFT D,SHFT S]") OR THE LETTERS CMDR (COMMODORE) AND A KEY ("[CMDR Q,CMDR G,COMDR Y,CMDR H]"). IF A SYMBOL IS REPEATED, THE NUMBER OF REPITITIONS WILL BE DIRECTLY AFTER THE KEY AND BEFORE THE COMMA ("[SPACE3,SHFT S4,CMDR M2]").

HOW TO ENTER PROGRAMS

You can enter these lines by abbreviating the commands when you enter the line. The abbreviations for BASIC commands are in your user guide.

If you type a line that is longer than the acceptable number of characters, the computer will act as if everything is ok, until you press RETURN. Then, a syntax error will be displayed (without a line number). Many people write that the computer gives them a syntax error when they type the line, or that the computer refuses to accept a line. Both of these problems are results of typing a line that has too many characters.

The Program Won't Run!!

This is the hardest of problems to resolve; no error message is displayed, but the program just doesn't run. This can be caused by many small mistakes typing a program in. First check that the program was written for the computer you are using. Check to see if you have left out any lines of the program. Check each line of the program for typos or missing parts. Finally, press the RUN/STOP key while the program is "running." Write down the line the program broke at and try to follow the program backwards from this point, looking for problems.

If All Else Fails

You've come to the end of your rope. You can't get the program to run and you can't find any errors in your typing. What do you do? As always, we suggest that you try a local user group for help. In a group of even just a dozen members, someone is bound to have typed in the same program. The user group may also have the program on a library disk and be willing to make a copy for you. For $9.95 per issue, you can also get all the BASIC programs in each issue, as well, from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007.

If you do get a working copy, be sure to compare it to your own version so that you can learn from your errors and increase your understanding of programming.

If you live in the country, don't have a local user group, or you simply can't get any help, write to us. If you do write to us, include the following information about the program you are having problems with:

The name of the program
The issue of the magazine it was in
The computer you are using
Any error messages and the line numbers
Anything displayed on the screen
A printout of your listing (if possible)

All of this information is helpful in answering your questions about why a program doesn't work. A letter that simply states "I get an error in line 250 whenever I run the program" doesn't give us much to go on. Send your questions to:

Commodore Magazines
1200 Wilson Drive
West Chester, PA 19380
ATTN: Program Problem

HOW TO USE THE MAGAZINE ENTRY PROGRAMS

The Magazine Entry Programs on the next pages are two BASIC machine language programs that will assist you in entering the programs in this magazine correctly. There are versions for both the Commodore 64 and the Commodore 128. Once the program is in place, it works its magic without you having to do anything else. The program will not let you enter a line if there is a typing mistake on it, and better yet, it identifies the kind of error for you.

Getting Started

Type in the Magazine Entry Program carefully and save it as you go along (just in case). Once the whole program is typed in, save it again on tape or disk. Now RUN the program. The word POKING will appear on the top of the screen with a number. The number will increment from 49152 up to 49900 (4864-5545 on the 128) and just lets you know that the program is running. If everything is ok, the program will finish running and say DONE. Then type NEW. If there is a problem with the data statements, the program will tell you where to find the problem. Otherwise the program will say "mistake in data statements." Check to see if commas are missing, or if you have used periods instead of commas. Also check the individual data items.

Once the program has run, it is in memory ready to go. To activate the program type SYS49152 (SYS4864 on the 128), and press RETURN. You are now ready to enter the programs from the magazine. To disable the Entry Program, just type KILL (RETURN) on the 64 or SYS4867 on the 128.

The checksums for each line are the same for both the 64 and 128, so you can enter your 64 programs on the 128 if you'd like.

Typing the Programs

All the BASIC program listings in this magazine that are for the 64 or 128 have an apostrophe followed by four letters at the end of the line (e.g., 'ACDF). If you plan to use the Magazine Entry Program to enter your programs, the apostrophe and letters **should** be entered along with the rest of the line. This is a checksum that the Magazine Entry Program uses.

Enter the line and the letters at the end and then press RETURN, just as you normally would.

If the line is entered correctly, a bell is sounded and the line is entered into the computer's memory (without the characters at the end).

If a mistake was made while entering the line, a noise is sounded and an error message is displayed. Read the error message, then press any key to erase the message and correct the line.

IMPORTANT

If the Magazine Entry Program sees a mistake on a line, it **does not** enter that line into memory. This makes it impossible to enter a line incorrectly.

Error Messages and What They Mean

There are five error messages that the Magazine Entry Program uses. Here they are, along with what they mean and how to fix them.

Continued next page

HOW TO USE THE MAGAZINE ENTRY PROGRAMS

NO CHECKSUM: This means that you forgot to enter the apostrophe and the four letters at the end of the line. Move the cursor to the end of the line you just typed and enter the checksum.

QUOTE: This means that you forgot (or added) a quote mark somewhere in the line. Check the line in the magazine and correct the quote.

KEYWORD: This means that you have either forgotten a command or spelled one of the BASIC keywords (GOTO, PRINT. .) incorrectly. Check the line in the magazine again and check your spelling.

OF CHARACTERS: This means that you have either entered extra characters or missed some characters. Check the line in the magazine again. This error message will also occur if you misspell a BASIC command, but create another keyword in doing so. For example, if you misspell PRINT as PRONT, the 64 sees the letter P and R, the BASIC keyword ON and then the letter T. Because it sees the keyword ON, it thinks you've got too many characters, instead of a simple misspelling. Check spelling of BASIC commands if you can't find anything else wrong.

UNIDENTIFIED: This means that you have either made a simple spelling error, you typed the wrong line number, or you typed the checksum incorrectly. Spelling errors could be the wrong number of spaces inside quotes, a variable spelled wrong, or a word misspelled. Check the line in the magazine again and correct the mistake.

MAGAZINE ENTRY PROGRAM—64

The Magazine Entry Programs are available on disk, along with the other programs in this magazine, for $9.95. To order, contact Loadstar at 1-800-831-2694.

```
10 PRINT"[CLEAR]POKING -";
20 P=49152 :REM $C000   (END AT
   49900/$C2EC)
30 READ A$:IF A$="END"THEN 110
40 L=ASC(MID$(A$,2,1))
50 H=ASC(MID$(A$,1,1))
60 L=L-48:IF L>9 THEN L=L-7
70 H=H-48:IF H>9 THEN H=H-7
80 PRINT"[HOME,RIGHT12]"P;
90 IF H>15 OR L>15 THEN PRINT
   :PRINT"DATA ERROR IN LINE";
   1000+INT((P-49152)/8):STOP
100 B=H*16+L:POKE P,B:T=T+B:P=P+1
   :GOTO 30
110 IF T<>86200 THEN PRINT
   :PRINT"MISTAKE IN DATA --> CHECK
   DATA STATEMENTS":END
120 PRINT"DONE":END
1000 DATA 4C,1F,C0,00,00,00,00,00
1001 DATA 00,00,00,00,00,0D,00,21
1002 DATA C1,27,C1,2F,C1,3F,C1,4C
1003 DATA C1,EA,EA,EA,4C,54,C0,A2
1004 DATA 05,BD,19,C0,95,73,CA,10
1005 DATA F8,60,60,A0,03,B9,00,02
1006 DATA D9,04,C1,D0,F5,88,10,F5
1007 DATA A0,05,B9,A2,E3,99,73,00
1008 DATA 88,10,F7,A9,00,8D,18,D4
1009 DATA 4C,EF,C0,E6,7A,D0,02,E6
1010 DATA 7B,4C,79,00,A5,9D,F0,F3
1011 DATA A5,7A,C9,FF,D0,ED,A5,7B
1012 DATA C9,01,D0,E7,20,2B,C0,AD
1013 DATA 00,02,20,74,C0,90,DC,A0
1014 DATA 00,4C,A9,C1,C9,30,30,06
1015 DATA C9,3A,10,02,38,60,18,60
1016 DATA C8,B1,7A,C9,20,D0,03,C8
1017 DATA D0,F7,B1,7A,60,18,C8,B1
1018 DATA 7A,F0,37,C9,22,F0,F5,6D
1019 DATA 03,C0,8D,03,C0,AD,04,C0
1020 DATA 69,00,8D,04,C0,4C,8E,C0
1021 DATA 18,6D,05,C0,8D,05,C0,90
1022 DATA 03,EE,06,C0,EE,09,C0,4C
1023 DATA CE,C1,18,6D,08,C0,8D,08
1024 DATA C0,90,03,EE,07,C0,EE,0A
1025 DATA C0,60,0A,A8,B9,0F,C0,85
1026 DATA FB,B9,10,C0,85,FC,A0,00
1027 DATA A9,12,20,D2,FF,B1,FB,F0
1028 DATA 06,20,D2,FF,C8,D0,F6,20
1029 DATA BC,C2,20,E4,FF,F0,FB,A0
1030 DATA 18,B9,08,C1,20,D2,FF,88
1031 DATA 10,F7,68,68,A9,00,8D,00
1032 DATA 02,4C,74,A4,4B,49,4C,4C
1033 DATA 91,91,0D,20,20,20,20,20
1034 DATA 20,20,20,20,20,20,20,20
1035 DATA 20,20,20,20,20,20,20,91
1036 DATA 0D,51,55,4F,54,45,00,4B
1037 DATA 45,59,57,4F,52,44,00,23
1038 DATA 20,4F,46,20,43,48,41,52
1039 DATA 41,43,54,45,52,53,00,55
1040 DATA 4E,49,44,45,4E,54,49,46
1041 DATA 49,45,44,00,4E,4F,20,43
1042 DATA 48,45,43,4B,53,55,4D,00
1043 DATA C8,B1,7A,D0,FB,84,FD,C0
1044 DATA 09,10,03,4C,84,C1,88,88
1045 DATA 88,88,88,B1,7A,C9,27,D0
1046 DATA 13,A9,00,91,7A,C8,A2,00
1047 DATA B1,7A,9D,3C,03,C8,E8,E0
1048 DATA 04,D0,F5,60,A9,04,4C,CA
1049 DATA C0,A0,00,B9,00,02,99,40
1050 DATA 03,F0,F0,C8,D0,F5,A0,00
1051 DATA B9,40,03,F0,E6,99,00,02
1052 DATA C8,D0,F5,20,96,C1,4C,12
1053 DATA C2,A0,09,A9,00,99,03,C0
1054 DATA 8D,3C,03,88,10,F7,A9,80
1055 DATA 85,02,A0,00,20,58,C1,20
1056 DATA 89,C1,20,ED,C1,E6,7A,E6
1057 DATA 7B,20,7C,A5,A0,00,20,80
1058 DATA C0,F0,D0,24,02,F0,06,4C
1059 DATA A8,C0,4C,CE,C1,C9,22,D0
1060 DATA 06,20,8D,C0,4C,CE,C1,20
1061 DATA BA,C0,4C,CE,C1,A0,00,B9
1062 DATA 00,02,20,74,C0,C8,90,0A
1063 DATA 18,6D,07,C0,8D,07,C0,4C
1064 DATA EF,C1,88,A2,00,B9,00,02
1065 DATA 9D,00,02,F0,04,E8,C8,D0
1066 DATA F4,60,18,AD,09,C0,69,41
1067 DATA 8D,09,C0,38,AD,0A,C0,E9
1068 DATA 19,90,06,8D,0A,C0,4C,1C
1069 DATA C2,AD,0A,C0,69,41,8D,0A
```

```
1070 DATA C0,AD,03,C0,6D,05,C0,48
1071 DATA AD,04,C0,6D,06,C0,8D,0C
1072 DATA C0,68,6D,08,C0,8D,0B,C0
1073 DATA AD,0C,C0,6D,07,C0,8D,0C
1074 DATA C0,38,E9,19,90,06,8D,0C
1075 DATA C0,4C,52,C2,AD,0C,C0,69
1076 DATA 41,8D,0C,C0,AD,0B,C0,E9
1077 DATA 19,90,06,8D,0B,C0,4C,67
1078 DATA C2,AD,0B,C0,69,41,8D,0B
1079 DATA C0,A0,01,AD,09,C0,CD,3C
1080 DATA 03,D0,20,C8,AD,0A,C0,CD
1081 DATA 3D,03,D0,17,C8,AD,0B,C0
1082 DATA CD,3E,03,D0,0E,AD,0C,C0
1083 DATA CD,3F,03,D0,06,20,CC,C2
1084 DATA 4C,4B,C0,98,48,68,4C,CA
1085 DATA C0,A9,20,8D,00,D4,8D,01
1086 DATA D4,A9,09,8D,05,D4,A9,0F
1087 DATA 8D,18,D4,60,20,A9,C2,A9
1088 DATA 81,20,DF,C2,A9,80,20,DF
1089 DATA C2,4C,D9,C2,20,A9,C2,A9
1090 DATA 11,20,DF,C2,A9,10,20,DF
1091 DATA C2,A9,00,8D,04,D4,60,8D
1092 DATA 04,D4,A2,70,A0,00,88,D0
1093 DATA FD,CA,D0,FA,60,END
```

END

MAGAZINE ENTRY PROGRAM—128

```
5 TRAP 200
10 PRINT"[CLEAR]POKING -";
20 P=4864 :REM $1300  (END AT
   5545/$15A9)
30 READ A$:IF A$="END"THEN 110
80 PRINT"[HOME,RIGHT12]"P;
100 B=DEC(A$):POKE P,B:T=T+B:P=P+1
    :GOTO 30
110 IF T<>59314 THEN PRINT
    :PRINT"MISTAKE IN DATA --> CHECK
    DATA STATEMENTS":END
120 PRINT"DONE":END
200 PRINT:PRINT"DATA ERROR IN LINE";
    1000+INT((P-4864)/8):END
1000 DATA 4C,1E,13,4C,3A,13,00,00
1001 DATA 8E,00,F7,00,42,41,51,57
1002 DATA 0D,00,0D,43,08,14,0E,14
1003 DATA 16,14,26,14,33,14,A9,00
1004 DATA 8D,00,FF,AD,04,03,8D,12
1005 DATA 13,AD,05,03,8D,13,13,A2
1006 DATA 4A,A0,13,8E,04,03,8C,05
1007 DATA 03,60,AD,12,13,8D,04,03
1008 DATA AD,13,13,8D,05,03,60,6C
1009 DATA 12,13,A5,7F,D0,F9,AD,00
1010 DATA 02,20,5B,13,90,F1,A0,00
1011 DATA 4C,6F,14,C9,30,30,06,C9
1012 DATA 3A,10,02,38,60,18,60,C8
1013 DATA B1,3D,C9,20,D0,03,C8,D0
1014 DATA F7,B1,3D,60,18,C8,B1,3D
1015 DATA F0,35,C9,22,F0,F5,6D,06
1016 DATA 13,8D,06,13,AD,07,13,69
1017 DATA 00,8D,07,13,4C,75,13,18
1018 DATA 6D,08,13,8D,08,13,90,03
1019 DATA EE,09,13,EE,0C,13,60,18
1020 DATA 6D,0B,13,8D,0B,13,90,03
1021 DATA EE,0A,13,EE,0D,13,60,0A
1022 DATA A8,B9,14,13,85,FB,B9,15
1023 DATA 13,85,FC,A0,00,8C,00,FF
1024 DATA A9,12,20,D2,FF,B1,FB,F0
1025 DATA 06,20,D2,FF,C8,D0,F6,20
1026 DATA 79,15,20,A3,15,20,E4,FF
1027 DATA F0,FB,A0,1B,B9,EF,13,20
1028 DATA D2,FF,88,10,F7,68,68,A9
1029 DATA 00,8D,00,02,4C,B7,4D,91
1030 DATA 91,0D,20,20,20,20,20,20
1031 DATA 20,20,20,20,20,20,20,20
1032 DATA 20,20,20,20,20,20,91,0D
1033 DATA 51,55,4F,54,45,00,4B,45
1034 DATA 59,57,4F,52,44,00,23,20
1035 DATA 4F,46,20,43,48,41,52,41
1036 DATA 43,54,45,52,53,00,55,4E
1037 DATA 49,44,45,4E,54,49,46,49
1038 DATA 45,44,00,4E,4F,20,43,48
1039 DATA 45,43,4B,53,55,4D,00,C8
1040 DATA B1,3D,D0,FB,C0,09,10,03
1041 DATA 4C,69,14,88,88,88,88,88
1042 DATA B1,3D,C9,27,D0,13,A9,00
1043 DATA 91,3D,C8,A2,00,B1,3D,9D
1044 DATA 00,0B,C8,E8,E0,04,D0,F5
1045 DATA 60,4C,5C,15,4C,C5,14,A0
1046 DATA 09,A9,00,99,06,13,8D,00
1047 DATA 0B,88,10,F7,A9,80,85,FD
1048 DATA A0,00,20,3F,14,20,AE,14
1049 DATA 20,0D,43,84,FA,A0,FF,20
1050 DATA 67,13,F0,D8,24,FD,F0,06
1051 DATA 20,8F,13,4C,8F,14,C9,22
1052 DATA D0,06,20,74,13,4C,8F,14
1053 DATA 20,9F,13,4C,8F,14,A0,00
1054 DATA B9,00,02,20,5B,13,C8,90
1055 DATA 0A,18,6D,0A,13,8D,0A,13
1056 DATA 4C,B0,14,88,60,18,AD,0C
1057 DATA 13,69,41,8D,0C,13,38,AD
1058 DATA 0D,13,E9,19,90,06,8D,0D
1059 DATA 13,4C,CF,14,AD,0D,13,69
1060 DATA 41,8D,0D,13,AD,06,13,6D
1061 DATA 08,13,48,AD,07,13,6D,09
1062 DATA 13,8D,0F,13,68,6D,0B,13
1063 DATA 8D,0E,13,AD,0F,13,6D,0A
1064 DATA 13,8D,0F,13,38,E9,19,90
1065 DATA 06,8D,0F,13,4C,05,15,AD
1066 DATA 0F,13,69,41,8D,0F,13,AD
1067 DATA 0E,13,E9,19,90,06,8D,0E
1068 DATA 13,4C,1A,15,AD,0E,13,69
1069 DATA 41,8D,0E,13,A0,01,AD,0C
1070 DATA 13,CD,00,0B,D0,20,C8,AD
1071 DATA 0D,13,CD,01,0B,D0,17,C8
1072 DATA AD,0E,13,CD,02,0B,D0,0E
1073 DATA AD,0F,13,CD,03,0B,D0,06
1074 DATA 20,89,15,A4,FA,60,98,48
1075 DATA 68,4C,AF,13,A9,04,4C,AF
1076 DATA 13,A9,00,8D,00,FF,A9,20
1077 DATA 8D,00,D4,8D,01,D4,A9,09
1078 DATA 8D,05,D4,A9,0F,8D,18,D4
1079 DATA 60,20,61,15,A9,81,20,9C
1080 DATA 15,A9,80,20,9C,15,4C,96
1081 DATA 15,20,61,15,A9,11,20,9C
1082 DATA 15,A9,10,20,9C,15,A9,00
1083 DATA 8D,04,D4,60,8D,04,D4,A2
1084 DATA 70,A0,00,88,D0,FD,CA,D0
1085 DATA FA,60,END
```

END

VIZASTAR

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design an unlimited number of different sort, search, report and printout routines which can pinpoint and display vital information in a split second. The results of these searches can be stored in the spreadsheets, or used to update data or create graphs.

Because *Vizastar 128* includes a macro language called Exec, you can actually program your spreadsheets and data bases to execute multiple functions automatically. For example, you can have the program prompt the user to input data, after which the Exec will manipulate it. This feature may be a little beyond the novice or occasional user, but is a godsend for those who use *Vizastar 128* daily. The manual and disk tutorial explain the feature and include examples. In fact, the disk tutorial is an Exec program itself.

The graphics program creates bar graphs and pie charts by using numbers generated by the spreadsheet or data manager. These graphs are high-resolution displays, which include labels and color. All data, regardless of which *Vizastar 128* program generates it (spreadsheet, data base or graph), can be dumped to a printer.

Vizastar 128 has four impressive improvements over the 64 version.

- Memory Size: The 60K of user memory means you should never need to push *Vizastar 128* to its limit. The original *Vizastar* for the 64 has only a fraction of that capacity, even with expansion.
- Screen Display: The screen display here is 80 columns instead of 40. While you can survive with 40 columns, 80 is almost mandatory for serious use.
- Speed: This version of *Vizastar* runs much faster (especially if you use the 1571 disk drive instead of the 1541). Sheet sorts alone are 100 times faster.
- Copy Protection: The removal of the copy protection from the program disk is a real plus if you intend to use *Vizastar 128* in your business. This means, as long as you have the original program safely stored away, you'll never waste a business day (or week) waiting on a software house to replace your program.

I don't think you'll find a more professional spreadsheet and data manager for the Commodore 128. When it comes to software for business, four requirements overshadow all other considerations—size, power, speed and flexibility. *Vizastar 128* has them all. C

MRS. MAC

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Module four introduces five more letters. The only new sound/symbols in module five are the qu and ck. Module six is another good review section that falls only slightly short because not all letters are addressed. I was also concerned that this section offered only 15 sound/symbol exercises.

The last module introduces the double consonants sh, ch, th and wh. These combinations of letters represent the set of consonants that group together as one sound. On the sequel disk, *Mrs. Mac's Vowels*, these sounds combine with vowels sounds.

Phonics is a reading system based on a step-by-step progression of skills and rules. Each skill becomes a foundation for the next. Learning to sound cat becomes possibly only when the child understands how the sounds in the word fit together. *Mrs. Mac's Consonants* helps the child make sense of this.

Mrs. Mac's Short Vowels

Anyone who works with students in kindergarten to grade two will want to add *Mrs. Mac's Short Vowels* to their library of educational programs. It is a good sequel to *Mrs. Mac's Consonants*.

The short vowels are introduced, reviewed and practiced in seven more modules, each of which is individually and quickly accessible. If you know the child's level of vowel expertise, you can select the appropriate teaching module. Beginning readers, like my grade-one friend Kyler, who recently mastered consonant sounds, should begin with module one, the introduction of A and I. More advanced grade-one students and beginning grade-two students may make better use of modules five through seven which provide review and practice or all short vowels and sentences.

Module one introduces only two vowels. A single graphic of, say, an apple, appears on the screen accompanied by the statement "A is for ..." A pause after "for" is a cue for the child to say apple, paying special attention to the sound of the letter A. The child will then apply an understanding of this sound by indicating that A is also the first sound of alligator. Choosing incorrectly returns the child to the apple model for a reminder of the A sound. The second vowel gets the same treatment.

The limited focus on only the vowels A and I in module one allows the student and teacher to concentrate on the thinking processes at work when the child hunts for and selects the one sound that will complete a word.

All the modules present 12 to 15 questions, with each vowel receiving roughly equal treatment. This is not as many as I'd like, but is sufficient considering the amount of vowel repetition throughout seven units.

In the second module, E is introduced while A and I are reviewed. The challenge now lies in distinguishing between the sounds of E and I. This distinction causes the most confusion.

Modules one and two increased Kyler's ability to analyze his speech for specific sounds, and gave him an initial trial stab at distinguishing between E and I sounds. The letter O is added in Module three, and its addition does not present a major new challenge. O was quickly learned by Kyler because it is so different from the other sounds. Module four adds the letter U.

Module five reviews all five short vowel sounds in one-syllable words and introduces short phrases and sentences. I was particularly impressed by Module six's graphics. For example, completing the word lamp resulted in a lamp graphic dimming and brightening. Simultaneously, the phrase "The lamp is on. The lamp is off." appears.

In Module seven Kyler encoded or printed letters represented by graphics. No beginning or end consonants were given as clues, so he had to sound out the whole word from beginning to end. Previous sections had prepared him adequately for this. Module seven also introduced words in patterns, such as mop, top and flop.

I found much to praise in *Mrs. Mac's Short Vowels*. The colorful and imaginative presentation of the program captured Kyler's attention. And the step-by-step introduction of its content assured success and competence at each level. The demands of the student and the teacher are met equally well.

Kyler and I both agree that *Mrs. Mac's Short Vowels* should be added to your educational library right next to its prerequisite, *Mrs. Mac's Consonants*. Following one with the other helps children learn to read by phonics more quickly and enjoyably than you thought possible. C

BY SHAY ADDAMS

Bastian, the Backseat Adventurer



News and opinion from a leading explorer of those fantasy realms called adventure games.

Does it irritate you when someone reads over your shoulder? If so, you may not enjoy *The Neverending Story* by Datasoft. In this game, a young boy named Bastian reads a book that tells of your adventure in Fantasia. It's a graphic game, and Bastian's picture appears intermittently to remind you he's still reading about your adventure. As in the film on which the the game is based, you must draw Bastian into the story to help you save Fantasia from The Nothing, an evil force that is consuming the very fabric of the universe.

Your adventure commences in the Great Forest, a horizontal band that spans the top half of the screen. The most prominent feature of the forest is a tall white tower. Somewhere within the tower lies an ailing empress whom you must rescue.

A standard two-word parser enables you to solve the object-oriented puzzles, and when you meet someone or reach a new location, the corresponding picture is displayed in a small window on the left side of the screen. Pick up an item and its picture is shown in an icon-like graphic on the right side.

The film's musical theme has been worked into the game, but there is an option to turn it off. The game uses real-time, which means that the clock keeps ticking even if you do nothing. And as time passes, The Nothing continues to feast upon Fantasia. However, there is a pause feature, so make sure that you use it when you are comtemplating. The puzzles and situations are fairly easy, and the game sneaks useful clues into the text.

The program is divided into three parts, and after you finish one, the next loads automatically. Each one loads entirely into RAM, which means that you never have to wait for disk access to see a new picture or read a response to your latest action. Best suited for novices, *The Neverending Story* may be too easy for advanced players.

This may also be the case with *Tass Times in Tone Town*. A graphic game designed by Michael and Muffy Berlyn for Activision, it dwells more heavily on the story and characters than skull-crushing problems (though puzzles abound).

More Adventure

You'll need a Commodore 128 or an Amiga to visit the alternative world of *Trinity*. The all-text *Trinity* is the second title in Infocom's Interactive Fiction Plus series. Unlike the first, *A Mind Forever Voyaging* for the Commodore 64, this one is packed with puzzles that will simultaneously delight and devastate text adventure fans.

In the intermediate-to-advanced difficulty range, *Trinity* kicks off in England as you wind up your summer vacation. When a nuclear missile appears in the sky, you have only a few minutes to find the entrance to another dimension. Otherwise, the missile explodes, London is vaporized and you are dead, dead, dead.

If you find the magic door, you'll enter a strange world filled with colossal mushrooms and lit by twin suns. There you must unravel the puzzle of a towering sundial and travel through time and space to atomic bomb tests in Russia, outer space and the South Seas. Your goal is to go back in history and prevent the advent of nuclear weaponry. This entails journeying to the test site of the first atomic bomb, code-named Trinity.

By mixing history and fantasy with logic and magic, author Brian Moriarty has created a unique adventure experience whose setting is hauntingly reminiscent of *Zork*'s Great Underground Empire. Moriarty's prose skills are among the finest in the trade, making *Trinity* as entertaining to read as it is to play. If you're still learning the ropes, try his *Wishbringer,* an outstanding introductory game for the Commodore 64.

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Mystery fans also have a good reason for upgrading to a 128, since that's what needed to investigate *The Scoop* from Telarium. This is the first adventure based on a story by Agatha Christie. In this tale, you are a British reporter investigating a series of grisly murders.

The game employs a menu-based parser so you can use a joystick to pick words that form commands rather than typing them. The game is illustrated and your character is animated. You interact with people as well as search for evidence, and you may become the killer's next victim if you're not careful.

Space Slugs from Planet X

Science fiction fans have a galaxy of new adventures and role-playing games from which to choose. Broderbund's latest Electronic Novel, *Breakers*, is a two-disk text game that wraps you in the robes of a Lau, a member of a mysterious race that dwells on the planet Borg in the distant Slug Nebulae. The planet is threatened by an ancient doom that only you can prevent by performing a sacred ritual.

But first you must escape Nimbus Colony (an industrial satellite orbiting Borg), smash a smuggling ring, and free the slaves—not necessarily in that order. The emphasis is on character interaction: conversing with space outlaws called Breakers to coax and wheedle information from them and other weirdos of the future.

In Infocom's *Leather Goddesses of Phobos*, you're kidnapped by a band of alien sex perverts who fly you to Phobos, one of Mars' moons, for "experimentation" in preparation for their planned invasion of earth. Satirizing science fiction of the Fifties, it reminds me more of an underground comic book by Robert Crumb. Madman Steve Meretzky, who wrote the humorous *Planetfall* and co-authored the zany *Hitchhiker's Guide*, concocted this provocative adventure, which has three playing modes: Tame, Suggestive and Lewd.

Lord British's *Auto Duel*, adapted from Steve Jackson's board game Car Wars, mixes a fast-moving shoot-'em-up with futuristic role-playing as you explore a futuristic America plagued by biker gangs and criminals. After buying a car and arming it with lasers, recoilless rifles and other exotic weaponry, you can engage in demolition derby-style "auto duels," go on the road as a vigilante in pursuit of outlaws, or become a courier for the ADAA (Autodueling Association of America.)

In the long run, your goal is to track down a major criminal. Clues turn up in different cities, sending you on a cross-country quest for outlaws. Crackling animation sets this car-driving simulation apart, and there's a fair amount of role-playing as you equip your cars with weapons much the way you outfit a paladin in *Ultima* with swords and armor.

I haven't seen *Roadwar 2000* yet, but the scenario sounds familiar. It is set in futuristic America after an atomic war, where you command 19 kinds of cars that can be modified for different tasks. But it may prove more difficult and involved than *AutoDuel*, for Strategic Simulations says this is a two-stage game. More on this in a future column.

SSI's latest entry in the realm of fantasy role-playing is *Shard of Spring*, a multi-character game with a conventional scenario. The island of Ymros needs a few good men—and/or women—to retrieve the Shard (some kind of crystal) and restore the climate of the doom-struck land, which will perish without it. Your party of up to five characters must defeat the evil enchantress Siriadene and her demon hordes.

For those of you still slugging away at *The Bard's Tale* after six months in the catacombs, take heart: The sequel, *Knight of Destiny*, is not as hard. (Electronic Arts should hand out medals to anyone who finished the original game.) But it is bigger, unfolding in six cities instead of just one, features 25 mazes instead of 16, and incorporates a new magic system.

But Wait, There's More

Now you can look forward to even more in this column. Next month I'll start slipping you a few clues, maybe even some outright answers, to those adventures and role-playing games that have been driving you up the wall. I'll also keep you up to date on the latest adventures of *Habitat*, Lucasfilm's on-line adventure game on QuantumLink, the Commodore 64-specific telecommunications network.

Until then, remember the last words of Adventurin' Al, who has been playing *The Bard's Tale* since January 12, 1986: "I don't need to map this maze, I'll just *remember* the way back to the exit." ■

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ABC Caterpillar *is designed to teach letter recognition and phonics.*

letters reappear on appropriate blank lines below the picture.

By focusing on the blending of one-syllable words, this section of *ABC Caterpillar* provides a valuable aid to beginning readers. Its bank of ten repeated words represents a cross-section of phonics that children learn over a period of months and even years. As such, section three, Three-Letter Game, is a useful supplementary activity for youngsters who need to practice skills they have already learned. Its ability to "instruct" these skills, however, is limited.

Section four is similar to section three in its presentation and theory. But this time the words are formed with four letters. Students beginning to learn the phonics approach to reading would not be able to encode the words in section four. Here students need to know phonetic elements that are usually taught and mastered over an even longer period of time, some during grade one, but many others during grade two or three.

ABC Caterpillar claims to be both a game and a reading instruction tool. Section one, the Alphabet Game, clearly demonstrates understanding of the principles of good teaching. On the other hand, the claim that *ABC Caterpillar* teaches children how to spell words is occasionally debatable. Section two, the First-Letter Game, can claim the most success.

Sections three and four cover too much phonics too thinly. The consequence is to reduce these sections to "game" status, or at best, practice and reinforcement of skills already learned. But after all is said and done, *ABC Caterpillar* deserves good marks for its noteworthy achievements in letter recognition, and equal amounts of encouragement for its attempts to help instruct the difficult concepts of phonics. ■

GEOS—*"Our first* Desk Pack *includes the Graphics Grabber, a tool for converting graphics from* The Newsroom, The Print Shop *and* Print Master *to* GEOS *format."*

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We also added input drivers. Now when you're in *Desktop,* you can select which device you want to use for input. Currently the only choice is a joystick, but we will be adding a driver for the new Commodore mouse. We are thinking about adding drivers for other devices as well: Koala pads or light pens, that sort of thing.

There were also some things added to the *geoWrite* word processor. Screens are updated faster and the scrolling is much faster. Fonts are managed dynamically. This means that instead of calling each font from disk each time, it keeps as many as possible in memory.

Finally, the *PhotoManager* now supports multiple albums. This lets you set up albums for items that logically would be grouped together, and support for a second drive has been changed to allow you to keep data for use in an application on a different drive.

Leeds: What changes have you made from 1.2 to 2.0 to *geoWrite?*

Dougherty: *GeoWrite* 2.0, which is one of four programs in the *Writer's Workshop,* has everything you ever wanted in a word processor. We've added the features our customer support people have told us users have requested, such as cut and paste, search/replace, keeping the cursor keys active, justifications, centering, and super- and subscripts. Headers and footers have been added with some additional features: the page number and date can be automatically added to each page, and you can include pictures.

There are now multiple rulers that let you change the formatting anywhere in the document. Line spacing can now be set to 1, 1.5, or 2 lines. Print styling, boldface and italics can now be toggled on while you are typing, so you don't have to use the mouse to select styles. Movement within the document has been made easier by adding support for the cursor keys.

But most importantly, we've added shortcuts for almost all the commands. Now beside each command in the menus are key equivalents, so you don't have to take your hands off the keyboard while typing.

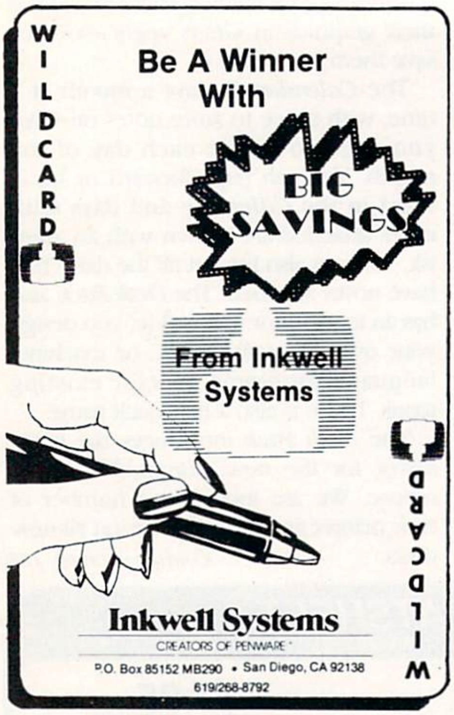
Leeds: You've also developed some other products. What's the *Desk Pack?*

Dougherty: The *Desk Pack* is a collection of *Desktop* accessories, small applications you might use daily, or that might enhance your ability to use other applications. For example, our first *Desk Pack* includes the *Graphics Grabber,* a tool for converting graphics from *The Newsroom, The Print Shop* and *Print Master* to *GEOS* format. This lets you use their graphics in *GEOS* applications or save them in albums.

The *Calendar* displays a month at a time, with space to store notes on what you need to do for each day of the month. You can page forward or backward in the *Calendar,* and days with notes attached are shown with an asterisk. You can also list out all the dates that have notes attached. The *Desk Pack* also has an icon editor that will let you design your own icons for BASIC or machine-language programs, or edit existing icons. There is also a Blackjack game.

The *Desk Pack* introduces the input driver for the new Commodore 1351 mouse. We are including a number of new printer and input drivers on all new disks.

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We also have a font disk with 20 new fonts available.

Leeds: What do you have planned in the way of new applications for *GEOS?*

Dougherty: We're already working on a spreadsheet that will have much of the functionality of *Excel* (a Macintosh spreadsheet). We are also developing database and charting programs. These programs will be able to use data generated from each other. You could develop charts from the spreadsheet data or move database information into the spreadsheet. The data base will have mail-merge capabilities in conjunction with *geoWrite.*

We have recently released a desktop publishing program. *GeoWrite* has hooks in it now to pipe information to a page layout program. The *Writer's Workshop* has a program called *geoLaser,* a Postscript driver to let you use the Apple LaserWriter printer.

We don't expect everyone who owns a Commodore computer to buy a LaserWriter printer, but one option we've announced is a service through QuantumLink, the only Commodore 64-specific telecommunications network, where users can send their finished files (proofed on their home printer) from the page layout program to QuantumLink via modem, and a laser-printer final draft will be mailed back to them. We also expect that the local instant print shops will begin to support a variety of computers, and you will be able to take your disk down to them and run off copies of your finished files.

Leeds: You've been working on a new version of *GEOS* as well, V1.3. What can you tell me about it?

Dougherty: The most notable addition to V1.3 is the support for Commodore 1764 RAM expansion pack via the RAM device. We think the RAM expansion unit is the greatest single performance booster you can add to your Commodore 64. *GEOS* uses the disk drive as a virtual memory, extending the effective memory of the 64 beyond its 64K of RAM. The turbo routines we use speed up the data transfer rate quite a bit, though there is still a wait when you scroll around on the screen. Using the RAM device, however, we can store an entire *GEOS* page in memory, and scroll it around with no delays. We can also



store an entire disk of applications and data in RAM for instant access.

If the 1750 RAM pack is used, we can also use a technique called shadowing, where we store a second disk's data in RAM, reading from RAM when we want information, and writing to the disk through RAM when we want to store information.

The DMA (direct memory access) chip in the RAM device is so fast that when we want to move blocks of data around inside the 64, it's faster to move it out to the RAM pack, then back to the new locations. This illustrates that we could create a new version of *GEOS* that uses the RAM pack as extended memory for the operating system. That's down the road a bit, but we've thought about it. Another idea we've thought about is an applications manager that lets you keep more than one application active in memory, letting you switch from application to application. Of course, all of these will depend on how popular the RAM packs become.

Leeds: Will there be a 128 version of *GEOS,* and if so, what new features will it have?

Dougherty: The 128 version will be basically V1.3 plus some features. We will take advantage of the additional memory by adding an applications manager and/or some other programs. The numeric keypad will be supported as well.

We have no plans to put *GEOS* on ROM for either the 128 or the 64. That's not to say we will never do it. But there's so much to be done, and other things need to be done first.

Leeds: What about BASIC for *GEOS?*

Dougherty: We have a *geoBASIC* program on the drawingboard, and we have had brainstorming sessions discussing the features we would like to see in it. One of our programmers has done some work on it, but at this time no code has been written. There is also no code yet done on a telecommunications package. QuantumLink is working on a *GEOS*-based QuantumLink package, but that's the extent of it.

There are four new products for use with *GEOS: Font Pack, Desk Pack, Writer's Workshop* and *geoDesk.* I'd like to see *geoCalc* and *geoFile* out by Christmas, but we may not finish testing in time. Any way you look at it, we'll have one great January Consumer Electronics Show. ■



TAKE THE Q-LINK CHALLENGE!

IF YOU WIN, GET THREE PRIZES!

• A MODEM

• A FOUR-MONTH Q-LINK MEMBERSHIP

• LUCASFILM'S *HABITAT* SOFTWARE

HERE'S HOW TO ENTER!

Simply complete the Challenge of the Month and send it with this coupon to Quantum Computer Services, 8620 Westwood Center Drive, Vienna, VA 22180. Attn: Challenge of the Month #_______ (fill in the correct Challenge of the Month number).

NAME ________________________________

ADDRESS ______________________________

CITY ______________ STATE ______ ZIP CODE _______

PHONE NUMBER (____) ___________________

YOU MUST ANSWER BOTH QUESTIONS TO WIN:

Are you currently a member of QuantumLink?

- ☐ Yes—if I win, extend my membership for four months.
- ☐ No—if I win, send me the Q-Link software and free four-month membership. If I get the Challenge correct but don't win, send me a free Q-Link software kit as a consolation prize.

Do you currently own a modem?

- ☐ Yes—if I win, send me a substitute prize.
- ☐ No—if I win, send me the modem.

Complete the Challenge of the Month correctly and you will be eligible to win a great prize package!

Each month, 20 individuals will be chosen from the pool of correct Challenge entries and the winners will receive a prize package that includes all this!

- **A free Commodore 300-baud modem (Model 1600).** With this modem, you'll be able to hook up your Commodore 64 or 128 to a telephone and access QuantumLink, the official on-line service for Commodore owners.
- **A free QuantumLink four-month membership.** QuantumLink membership normally costs just $9.95 per month, and includes unlimited use of a base tier of services and one free hour of access each month to special Plus services. As a Challenge winner, you'll get QuantumLink software and your first four months membership free!
- **A free copy of Lucasfilm's *Habitat* software.** *Habitat* is the new multi-player game that utilizes the QuantumLink network to interconnect thousands of Commodore owners from across the country. Participants can quest for hidden treasure, investigate intriguing mysteries, and participate in the ongoing drama of this innovative and exciting graphic adventure.

Consolation Prize!

If the Challenge entry you submit is correct, but your name is not chosen from the pool of correct entries, you will be sent a Q-Link software kit for FREE!

CHALLENGE OF THE MONTH #2

FIND THESE WORDS:

BAUD	BINARY
MEMORY	QLINK
FUNCTION	FILE
COMMANDS	MENU
DOWNLOAD	UPLOAD
JOYSTICK	LOGIC
BIT	COMPUTER
BYTE	SOFTWARE
ROM	PROTOCOL
RAM	BUFFER
DATA	DISK
COMMODORE	HABITAT
PROGRAM	BOOT
MODEM	LOAD
HARDWARE	ONLINE
SYSTEM	NETWORK

H	R	P	M	E	M	O	R	Y	D	U	A	B
A	E	R	E	R	N	O	I	T	C	N	U	F
B	F	O	T	A	C	O	M	M	A	N	D	S
I	F	T	S	W	D	A	O	L	N	W	O	D
T	U	O	Y	D	J	O	Y	S	T	I	C	K
A	B	C	S	R	S	N	E	A	Q	S	B	O
T	D	O	N	A	S	L	M	G	L	B	I	T
O	I	L	R	H	E	I	E	E	I	T	N	U
O	S	S	M	I	R	N	N	L	N	G	A	P
B	K	R	O	W	T	E	N	I	K	U	R	L
L	O	A	D	F	S	T	T	F	O	O	Y	O
M	Y	O	E	E	T	Y	B	U	G	U	C	A
A	F	R	M	O	M	W	U	R	P	S	I	D
R	T	A	R	B	U	G	A	T	Q	M	G	U
A	N	A	T	O	U	M	M	R	L	I	O	N
E	R	O	D	O	M	M	O	C	E	K	L	C

BY ROBERT W. BAKER

Inside QuantumLink



Explore the inner workings of the QuantumLink telecommunication service with network pro Bob Baker.

Downloading Public Domain Software

Quantumlink sysops spent many long hours this past autumn restructuring their public domain libraries to a standard format. The updated descriptions now include a subject line, file type and size, approximate download time, required equipment and associated files, and number of downloads required per file. Files can be viewed by subject or file name, and can be directly downloaded.

Q-Link has thousands of these public domain programs available, and all you need is a formatted disk. Of course, you must make sure that your formatted disk has enough space for the programs you wish to download. In fact, it's a good idea to have a freshly formatted disk handy whenever logging onto the system. And always remember to remove your Q-Link disk before downloading.

To download a program, follow the menu or message instructions as they appear. Don't rush with your responses. Check each message and follow the directions closely. If you run into any problems, you can usually press F5 to abort.

Read the file descriptions carefully to make sure you get any associated files that are also required to use the program. Also check for any special instructions on how to use the program or information on available documentation files that may also be downloaded. If the file heading indicates there are responses to the file, be sure to check them as well. Any replies or remarks added to the original description may contain additional information that could save valuable time.

You might also want to consider saving the file description on disk along with the program. This can be especially helpful if the file description contains detailed operating instructions. Remember that the F3 key can be used to save a snapshot of most screen displays to your disk, including file descriptions. These screen displays can be printed later (after you log off the system) by using SPRINT or some other utility that can print sequential text files.

If you are having trouble using a particular program, check the program description for something you might have missed. Also recheck for added remarks or replies that might shed some light on your problem. If all else fails, you can send an E-mail message to the person who uploaded the file or the sysop who manages that area.

Be aware that many of the download files are actually libraries or collections of files, created using any of several available utilities. This helps eliminate the need to download a large number of individual files and generally helps save download time. These files usually have a special suffix added to the file name to indicate what utility was used to create the file. For instance, .lbr stands for Library, .lnx stands for Lynx, and .arc stands for Arc.

The file description should indicate what version of the utility was used to create

the file, since the same or later version is generally required to successfully extract the files from the library. All of the required utilities, plus different revisions and documentation can be found in the Telecom Utility Library.

Hot Off the Wire

The Tutoring Center, located in the Learning Center, is staffed by certified teachers from across the country, who offer tutoring sessions and assistance with basic academic skills. Tutoring is presently available in English, Math, Sciences and BASIC programming. Q-Link plans to expand this area, including help for teens preparing for the Scholastic Aptitude Test (SAT).

CitiLink, located in the News & Information Center, contains up-to-date news and message boards for various major cities. This area was just getting off the ground early last fall, but should be in full swing by now. Here you can network with other people in your area and keep abreast of what's happening on your local scene. Local reporters maintain their associated message board and provide information on entertainment, dining, exhibitions and places to see.

MatchMaking was still in the planning stages in the fall, but should be accessible by the time you read this. This area is for users seeking others with similar interests.

If you're using *GEOS* on your Commodore 64 or 128, you should check out the special *GEOS* section on Q-Link. Several people from Berkeley Softworks are on regularly, answering questions and providing information. C

Bob Baker is in charge of the New Products Information area on the QuantumLink network. He can be reached on Q-Link via E-mail addressed to RBAKER.

SANDIEGO

Continued from pg. 20

has detailed descriptions of all Carmen Sandiego's V.I.L.E. members; and the *1986 World Almanac and Book of Facts,* a 900-page reference volume that is essential to unravel the cases.

To add some excitement, a time limit has been incorporated, requiring that the assignment be completed inside of a week's time. This puts some additional pressure on you, since every investigative action will drain some precious sand from the hourglass. Travel to question a witness and a couple of hours will be lost. Take a jet from one city to the next and watch the time fly by. There's even a mandatory nine-hour rest period each night to make sure that you're not cutting corners by skimping on sleep. Your work schedule will be tight, and if you don't plan ahead, you're certain to fail.

What might go unnoticed behind all of the excitement of this fast-paced intrigue is that above all else, *Where in the World Is Carmen Sandiego?* stands as a well developed teaching tool. In solving the various international crimes, one can't help but pick up a semester's worth of lessons in world geography. By the time you become an ace detective, you'll know such obscure facts as the best market for wild yak skins, where to go to raft the Tigris, and where to unload your pocketful of forints.

But even more importantly, the younger audience will also learn just how resourceful a reference book can be. The *World Almanac* is an inexhaustible source of information, whether you are researching a problem or simply browsing for facts. Once familiar with its worth, I'm sure players will find room for this book in the family library.

Since this program is more interested in educating than frustrating, it should come as no surprise that the crime-stopping mini-adventures never rise above an intermediate level of difficulty. All movement options are menu-driven, helping to guide the players along by limiting their possible routes. There are no baffling twists, tricks or pitfalls. Even the hardest of the five difficulty levels can be approached without hesitation, since all the information necessary to solve each crime is given in the documentation. To be successful, a player just has to be willing to dig a little.

It's an ideal educational structure, one that makes *Where in the World Is Carmen Sandiego?* an entertaining and highly recommended program.

MIND WALKER

Continued from pg. 18

and go for a new game.

The documentation for *Mind Walker* is worthwhile reading. So far as games go, you are in new territory here, and reading the booklet is a must if you are to have any idea what you are about. It is also entertaining, setting the tone for the game by refusing to take itself seriously, yet giving you what you need in order to navigate the wonders of the mind.

Like the game itself, the documentation is colorful, and profusely illustrated with drawings and screen shots that will help you recognize some of the all-but-indescribable terrain in which you'll find yourself wandering. Think of it as a guidebook to the imagination.

It has a root in maze games, and you might even argue that it has a root in the adventure game, where hazards must be overcome and objects gathered in order to win. And you might even be right—as will be the person who sees roots in *Qbert* because of the way you must transform squares by standing on them.

The truth is that *Mind Walker* has many roots, but it is in the amalgamation that *Mind Walker* becomes an experience in and of itself. With its use of color, shapes, perspective, animation and stereo sound, *Mind Walker* almost becomes an art form. It is more an experience than a game.

Because it uses so many of the Amiga's capabilities, it is fair to say that the game could not exist in anything close to its present form on any other computer. *Mind Walker* succeeds in redefining the Amiga by bringing forth something we've never seen before. C

ADVERTISERS INDEX

Commodore® 64

GRAPHICS CONTEST

Create gorgeous graphics on your Commodore 64 using your favorite graphics package or programming aid—and maybe YOU will be our grand prize winner. Winners will receive a cash prize and the winning graphics screens will be published in the June, 1987, issue of Commodore Magazine.

Carefully read the rules below. Then fill out the official entry blank and submit it with your best graphics screens on disk to *Commodore Magazine,* 1200 Wilson Drive, West Chester, PA 19380, ATTN: GRAPHICS CONTEST.

DEADLINE FOR ENTRY: JANUARY 31, 1987 MAXIMUM 2 SCREENS PER CONTESTANT

RULES: Commodore 64 Computer Graphics Contest

1. You will be judged on originality, creativity and best use of the Commodore 64's unique graphics features.
2. A maximum of two screens per person is allowed. If a contestant submits more than two screens for consideration, all of that person's entries will be invalidated.
3. All entries must be submitted on disk, 1541 format, with the following marked clearly on the disk's label:
   a. Contestant's name, address and phone number
   b. Picture title(s)
   c. Graphics package or programming aid used to create the graphics
   d. The words 'GRAPHICS CONTEST'
4. Make sure your mailer will protect your disk from damage. Affix sufficient first-class postage. Mail your disk and the official entry blank to the address shown above in time to reach us by the January 31, 1987 deadline.

GENERAL CONDITIONS

Contest is open to any U.S. resident except employees of Commodore Business Machines, Inc., Commodore Electronics Ltd., Commodore International Ltd., their advertising and promotional agencies and their immediate families.

Entries will be judged by a panel of nationally known computer artists. Each entry must be wholly the product of the developer in whose name the entry has been submitted. Outside assistance is expressly prohibited and will provide cause for disqualification. An entry must consist of no more than two self-contained, complete programs on disk. A photo of the screen display or a program print-out does not constitute an acceptable entry. Entries become the property of *Commodore Magazine,* which reserves the right to adapt, use of publish all entries received. No disks will be returned, so be sure to make a copy of your entry before you submit it to the contest.

Commodore Magazine assumes no responsibility for lost, late or misdirected entries. Non-winning entries will not be acknowledged. Winners will be notified by February 28, 1987. Taxes on cash prizes are the winners' responsibilities.

Offer void wherever prohibited or restricted by law.

Fame and Fortune Can be Yours!
Grand Prize: $500 and Publication in *Commodore Magazine*
Five Runners Up: $100 and Publication in *Commodore Magazine*
Honorable Mention: Publication in *Commodore Magazine*

NAME ______________________ PHONE __________
ADDRESS ______________________
CITY ______________ STATE __________ ZIP __________
AGE __________ SIGNATURE ______________________
PARENT'S SIGNATURE (IF CONTESTANT IS UNDER 18) ______________________
GRAPHICS PACKAGE OR PROGRAMMING AID USED ______________________
PICTURE TITLE #1 ______________________
PICTURE TITLE #2 ______________________